

submitted on May 17, 1979 by the Minnesota Pollution Control Agency.

2. Section 52.1223 is revised to read as follows:

§ 52.1223 Approved status.

With the exceptions set forth in this subpart, the Administrator approves Minnesota's plans for the attainment and maintenance of the national standards under Section 110 of the Clean Air Act. Furthermore, the Administrator finds the plans satisfy all

requirements of Part D, Title I, of the Clean Air Act as amended in 1977, except as noted below.

3. Section 52.1226 is revised to read as follows:

§ 52.1226 Attainment dates for national standards.

The following table presents the latest dates by which the national standards are to be attained. The dates reflect the information presented in Minnesota's plan.

Air quality control region and nonattainment area	TSP		Pollutant SO ₂		NO _x	CO	O ₃
	Primary	Secondary	Primary	Secondary			
Central Minnesota Interstate:							
a. St. Cloud Metropolitan Nonattainment Area	c	a	d	d	d	f	d
b. Remainder of AQCR	c	a	d	d	d	d	d
Southeast Minnesota-La Crosse (Wisconsin) Interstate:							
a. Red Wing Region	c	h	a	a	d	d	d
Duluth (Minnesota)-Superior (Wisconsin) Interstate:							
a. Cloquet Nonattainment Area	a	h	c	a	d	d	d
b. Masabi Iron Range Nonattainment area	a	h	c	a	d	d	d
c. Silver Bay Nonattainment Area	a	h	c	a	d	d	d
d. Remainder of AQCR	a	a	c	a	d	d	d
Metropolitan Fargo-Moorhead Interstate	c	a	d	d	d	d	d
Minneapolis-St. Paul Intrastate	a	a	a	a	d	May 31, 1975 ^e	d
Northwest Minnesota Intrastate:							
a. East Grand Forks Nonattainment Area	c	h	d	d	d	d	d
b. Remainder of AQCR	c	a	d	d	d	d	d
Southwest Minnesota Intrastate	d	d	d	d	d	d	d

a. July 1975.

b. 5 years from plan approval or promulgation.

c. Air quality levels presently below primary standards.

d. Air quality levels presently below secondary standards.

e. Transportation and/or land use control strategy to be submitted no later than April 15, 1973.

f. December 31, 1982.

g. December 31, 1987.

h. 18-month Extension granted.

NOTE.—Dates or footnotes which are italicized are prescribed by the Administrator because the plan did not provide a specific date or the date provided was not acceptable.

NOTE.—Sources subject to plan requirements and attainment dates established under Section 110(a)(2)(A) prior to the 1977 Clean Air Act Amendments remain obligated to comply with those requirements by the earlier deadlines. The earlier attainment dates are set out at 40 CFR 52.1226 (1978).

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40 CFR Part 52

[FRL 1361-5]

Approval and Promulgation of Implementation Plans; Final Revision to Idaho State Implementation Plan

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On July 10, 1979 EPA published in the Federal Register an Advanced Notice of Proposed Rulemaking (44 FR 40360-61) describing the settlement reached between the Bunker Hill Company and EPA on June 11, 1979 and announcing its availability for inspection. Thereafter, on September 7, 1979, EPA proposed to promulgate the

Settlement Agreement reached between the Bunker Hill Company and EPA as a revision to the Idaho State Implementation Plan (SIP) (44 FR 52271 *et seq.*). EPA is today taking final action to promulgate, without change, the proposed rule as a revision to the Idaho SIP.

DATE: This rule will become effective January 14, 1980.

ADDRESSES: The Settlement Agreement, Interim Regulation and materials relevant to this final action are available for inspection at the following EPA offices:

Air Programs Branch, M/S 629, Docket No. 10A-79-4, Environmental Protection Agency, 1200 Sixth Avenue, Seattle, Washington 98101.

Central Docket Section, Room WSM-2903B, Environmental Protection Agency, 401 M. Street, SW., Washington, DC 20460.

COMMENTS SHOULD BE ADDRESSED TO:

Laurie M. Kral, Environmental Protection Agency, Air Programs Branch, M/S 625, 1200 Sixth Avenue, Seattle, Washington 98101, Telephone No. (206) 442-1226, (FTS) 399-1226.

FOR FURTHER INFORMATION CONTACT:

George C. Hofer, Chief, Technical Support and Special Projects Section, Air Programs Branch, M/S 625, Environmental Protection Agency, 1200 Sixth Avenue, Seattle, Washington 98101, Telephone No. (206) 442-1125, (FTS) 399-1125.

SUPPLEMENTARY INFORMATION:

Background

On January 1972, the State of Idaho submitted a State Implementation Plan (SIP) to EPA in accordance with Section 110 of the Clean Air Act. On May 31, 1972, EPA approved the SIP except for the sulfur dioxide (SO₂) control strategy and compliance schedule sections (37 FR 10842). On October 7, 1974, EPA proposed regulations for the control of SO₂ from the Bunker Hill complex requiring 96 percent permanent control of SO₂ (39 FR 36018). Thereafter, on January 10, 1975, the State of Idaho submitted to EPA, as a proposed revision to the SIP, a regulation (Regulation S) for the control of SO₂ at the Bunker Hill complex. On April 10, 1975, EPA proposed to disapprove the Idaho submission on the grounds that it did not meet the requirements of Section 110 of the Clean Air Act and 40 CFR Section 51.13. On November 19, 1975, EPA approved portions of the State of Idaho's Regulation S including the ultimate emission limitation, disapproved other portions of Regulations S including the interim emission limitation, and promulgated federal regulations to replace the disapproved portions (40 FR 53584). Thereafter, the Bunker Hill Company challenged EPA's final rulemaking action in this matter.

The United States Court of Appeals for the Ninth Circuit issued its opinion on July 5, 1977 and remanded the matter back to EPA for further administrative proceedings.¹ The Court stated that a more extensive administrative record was needed to show that the requirements promulgated by EPA dealing with the interim emission limitation were technologically feasible.

In response to a request by Bunker Hill, EPA promulgated regulations on

¹Bunker Hill Company v. EPA, 572 F.2d 1286 (9th Cir. 1977), hearing denied, No. 75-3670 (December 28, 1977).

November 8, 1977 defining requirements pertaining to excess emission caused by startup, shutdown or malfunction of equipment (42 FR 58171). On November 23, 1977, Bunker Hill challenged EPA's rulemaking on excess emissions and EPA consented to consolidate the November 8, 1977 regulations with the remand of the November 19, 1975 regulations.

During the period of time from December 28, 1977 through June 11, 1979, EPA and the Bunker Hill Company engaged in extensive document discovery, document production, and the development of written testimony for the remand proceedings. Concurrently, EPA and the Bunker Hill Company entered into a preliminary understanding which set forth, in principle, the areas of agreement between EPA and the Bunker Hill Company. On June 11, 1979, representatives of the Bunker Hill Company and EPA executed a Settlement Agreement and Interim Regulation which is the basis for this rulemaking.

The regulations promulgated by EPA in November 1975 called for an interim overall plant SO₂ emission limit of 680 tons per week (approximately 82 percent control), acid plant tailgas limits of 2600 parts per million (ppm) (6-hour average) and a prohibition of bypassing strong gas streams around the acid plant and to the atmosphere. In the technical support document for that rulemaking EPA suggested that supplemental SO₂ injection techniques using a sulfur combustion furnace could be utilized to remedy certain acid plant design deficiencies to enable Bunker Hill to meet the SO₂ control requirements. The sulfur combustion furnace was not a regulatory requirement but rather was suggested as one possible remedy to the SO₂ control problems at Bunker Hill.

As a result of the remand proceedings, EPA initiated a complete re-evaluation of the remanded SO₂ control regulation. The purpose of the review was to demonstrate that either the existing regulation or a more stringent regulation was technically feasible and also to present numerous alternative methods for meeting SO₂ control requirements.

The review included two major segments—an analysis of the Bunker Hill operation and an evaluation of other non-ferrous smelters and acid plants where a high degree of SO₂ capture had been achieved. In addition, the cost and feasibility of SO₂ control alternatives were examined. The technical material supporting this proposed rulemaking is summarized in a report entitled "Summary of Technical Material Supporting EPA Rules

Governing Sulfur Dioxide Capture at Bunker Hill", August 1979.

In brief, if EPA were to carry out the remand, it would be the Agency's contention that the technical information gathered during the remand proceedings affirms the technological feasibility of the original November 19, 1975 and November 8, 1977 EPA rulemaking and perhaps a more restrictive degree of control. However, as a result of the 1977 Clean Air Act Amendments, these questions are to be decided under Section 119 of the Act. It is the Administrator's judgment on the basis of information submitted by Bunker Hill during the remand proceedings that Bunker Hill will probably be eligible for a primary Nonferrous Smelter Order (NSO) under Section 119 when final national NSO rules are promulgated.

Implementation of The Settlement Agreement

In accordance with the Settlement Agreement, EPA is today taking final Agency Action to promulgate the regulatory portion of the Settlement Agreement (Section II) as a revision to the Idaho State Implementation Plan (42 CFR Part 52, Subpart N). Information gathered and testimony prepared by EPA as well as other related materials which have been previously prepared for the remand proceedings and settlement negotiations are contained in the docket and form the basis for the provisions of the Interim Regulation.

The Settlement Agreement provides, in brief, that EPA will ultimately issue a first NSO under Section 119 of the Act to Bunker Hill. The Agreement specifies the contents of the NSO, and provides procedures for its issuance. Because EPA has not yet promulgated final national rules governing the NSO program, the Agreement calls for the terms of the NSO to be implemented in the interim through a revision of the Idaho SIP, through appropriate rulemaking procedures.

It should be noted that EPA would ordinarily be legally prohibited by Sections 110, 123, and 302 of the Act from allowing the use of unauthorized dispersion techniques in a SIP. However, the Administrator believes that this situation presents unique circumstances under which the provisions of the savings clause (Section 406) of the Clean Air Act Amendments of 1977 (Pub. L. 95-95) permit the interim amendment of the existing Idaho SIP. The Administrator also believes that after promulgation of the final national NSO rules, provisions allowing the use of dispersion techniques must be removed from the SIP and those

provisions then be converted into an NSO if Bunker Hill is eligible.

The Agreement also provides that Bunker Hill will not challenge the first NSO if it contains the same terms as specified by the Agreement. EPA has agreed to treat the detailed technical and economic information submitted by Bunker Hill during the remand proceeding as Bunker Hill's NSO application. That material contains substantially the same information EPA has proposed to require of all NSO applicants. The provisions of the Interim Regulation and the first NSO issued to them will govern the obligation of Bunker Hill with respect to interim (SO₂) controls until the January 1, 1983 expiration date of the first NSO.

The Regulation

Emission Limits. The proposed regulation establishes SO₂ emission limits which Bunker Hill must meet by June 11, 1980. These limits include an overall plant SO₂ emission limit from the two tall stacks of 625 tons per running 7-days. One exceedence of the 7-day limit is allowed per calendar quarter. The overall limit includes acid plant bypass emissions and excess emissions caused by start-up, shutdown, maintenance and malfunction. Acid plant tailgas SO₂ emissions are limited to 2600 ppm averaged over a running 6-hour period. All emissions are to be measured by approved continuous monitoring equipment which meet specified criteria.

Excess Emissions. Bypass of process exhaust strong gas streams around an acid plant is excused but only under five narrowly defined situations. The regulation specifies the amount of time bypass can occur following process or acid plant breakdown. It also specifies the amount of time (in terms of operating parameters) that process exhaust gas can bypass the acid plant during acid plant restart. After June 11, 1980 and except as described below, Bunker Hill is prohibited from continuing to operate its processes while the applicable acid plant is shutdown for the annual maintenance period.

Annual Acid Plant Maintenance Offset. Continued process operation while an acid plant is shutdown for annual maintenance is allowed to occur for up to 14 days per year provided an offset of emissions is achieved. An interim method is provided to establish the offset until the new SO₂ control system is on line. Effective June 11, 1982 for every ton of SO₂ that is bypassed during the annual maintenance period Bunker Hill must, during the course of the year, capture an additional ton of SO₂. Such additional SO₂ must be removed from either the sinter machine

weak stream or the blast furnace SO₂ stream—neither of which are currently controlled.

Fugitive SO₂ Emission Program. The Bunker Hill Company is required to install a system to eliminate over 90 percent of the blast furnace upset conditions. This system should result in the capture of approximately 21 tons per week of fugitive SO₂ emissions. Those emissions will be released to the atmosphere via the main stack. If the blast furnace fugitive emission program captured less than 21 tons per week, the overall plant SO₂ emission limit will then be reduced by that portion of the 21 ton per week which is not captured.

Research and Development Program. The regulation requires the Company to immediately commence a continuous research and development program. Bunker Hill is, however, provided with the option of either employing a full scale or a reduced scale program. Successful implementation of the full scale program would satisfy the acid plant maintenance offset provision. If the Company chooses to implement the reduced scale program, the smelting processes must be shutdown while the applicable acid plant is shutdown during the annual acid plant maintenance period.

The reduced scale program requires that by February 11, 1982 an FGD system must be placed into service to treat a portion of either the sinter machine weak SO₂ stream or the blast furnace exhaust gas. Under the terms of the regulation, the reduced scale program must have a minimum volume operating capacity of 5000 scfm, 95 percent SO₂ capture efficiency, 95 percent on-line availability, continuous measurement instrumentation and must be automatically controlled.

Supplementary Control System. The Company is allowed to employ SCS to meet NAAQS using an SCS implementation plan and operating manual approved by EPA. SCS program deficiencies defined by an EPA study entitled "Review of the SCS Used by the Bunker Hill Company-Kellogg, Idaho" (EPA 330/2-79-001) must be corrected.

A study must also be performed by Bunker Hill to demonstrate that ambient SO₂ monitors are located in all areas of maximum expected ambient SO₂ concentrations. Alternative techniques are allowed where air quality in a monitored location is used in conjunction with modelling techniques to predict SO₂ concentrations elsewhere. The modelling techniques, however, must be calibrated using temporary SO₂ monitors. A compliance schedule specifies when the study is to be complete, when a revised SCS plan and

operational manual are to be submitted and when the new SO₂ monitors are to be placed into service. Until such time that the Administrator approves the new SCS program, the existing SCS and SO₂ monitors will be used on an interim basis to assure attainment of NAAQS.

Comments

The Agency on September 7, 1979 as an element of the proposed rulemaking for this final action, solicited comments on all aspects of the proposed regulation. No comments were received by EPA during the comment period.

Judicial Review

Today's action constitutes final Agency action for the purpose of judicial review under Section 307(b)(1) of the Clean Air Act (42 U.S.C. 7607(b)(1)).

(Secs. 110, 119, 301, Clean Air Act as amended (42 U.S.C. 7410, 7419, and 7601); and sec. 406 of Pub. L. No. 95-95 (August 7, 1977)).

Dated: December 10, 1979.

Douglas M. Costle,
Administrator.

Part 52 of Chapter I, Title 40 of the Code of Federal Regulations is hereby amended as follows:

Subpart N—Idaho

Section 52.676, paragraphs (a)(2) and (b) are revised as set forth below and paragraph (b) is also amended by adding an Appendix A as set forth below:

§ 52.676 Control strategy: Sulfur oxides—Eastern Washington-Northern Idaho Interstate Region.

(a) * * *

(2) Regulation S of the "Rules and Regulations for the Control of Air Pollution in Idaho" is approved with the exception of Section IV. Section IV of Regulation S of the "Rules and Regulations for the Control of Air Pollution in Idaho" is disapproved and is replaced by paragraph (b) of this section as shown below.

(b) *Interim Regulation for control of sulfur dioxide (SO₂) emissions from the Bunker Hill Company lead and zinc smelter located in Shoshone County in the Idaho portion of the Eastern Washington-Northern Idaho Interstate Region.*—(1) *SO₂ Emission Limitations.* Effective on June 11, 1980, the owner(s) or operator(s) of the subject smelter shall comply with the requirements of paragraph (b)(1) in regard to the capture of SO₂. The requirements governing SO₂ gas stream bypass during the annual acid plant maintenance period as provided by paragraphs (b)(5) and (b)(6) shall become effective on June 11, 1979.

(i) The owner(s) or operator(s) of the smelter subject to paragraph (b)(1) of this section shall not cause or allow the discharge of gases in excess of:

(A) 2600 parts per million (by volume) SO₂ averaged over any hourly running 6-hour averaging period, from any sulfuric acid plant as determined by continuous monitoring equipment specified in paragraph (b)(1)(iv) of this section and in accordance with the compliance procedures specified in paragraph (b)(4)(iii) of this section. In determining violations of the 6-hour averaging period, no two violations shall contain any common hourly data points; and

(B) 567,000 kg (625 tons) SO₂ over a daily (midnight to midnight) running 7-day period as determined by continuous monitoring equipment² specified in paragraph (b)(1)(iv) of this section and in accordance with the compliance procedures specified in paragraph (b)(4)(iii) of this section. Such limitation is plant wide and shall apply to the sum total of SO₂ emissions from the lead smelter main stack and the zinc plant main stack and shall include all excess emissions as defined in paragraph (b)(2)(i) of this section. Except as provided in paragraph (b)(6)(ii) of this section the emission limitation shall not be exceeded more than once per three (3) month calendar quarter; e.g., January, February and March. Such single excused emission shall be the first exceedence of the 7-day limit in the three (3) month quarterly period. In determining violations of the 7-day limit, no two (2) violations shall contain any common daily (midnight-to-midnight) data points. As provided in Appendix A to this regulation and upon notification by the Enforcement Division Director of the EPA-Region X the plant wide emission limit shall be decreased to not less than 548,000 kg (604 tons) SO₂.

(ii) *Bypass Prohibition.* Except as provided in paragraph (b)(2)(ii) of this section all SO₂ gas streams discharged from any zinc plant roaster and from the strong gas exit point on the input end of the lead smelter sinter machine shall at all times be processed in an SO₂ removal facility. The owner(s) or operator(s) shall not cause or allow these SO₂ gas streams to be discharged to the atmosphere.

(iii) *Circumvention.* Other than for temporary process control or to temporarily prevent significant equipment damage, dilution air or other extraneous gases shall not be allowed to enter or combine with any process gas normally treated by an SO₂ removal

² The owner(s) or operator(s) shall have the right in any enforcement proceeding to raise the issue of the accuracy of continuous monitoring instruments.

facility or with any acid plant tailgas prior to SO₂ concentration or flow measurement where the purpose of such combination would be to:

(A) In other than the lead smelter or zinc plant main stacks decrease the concentration of SO₂ in such streams;

(B) Otherwise adversely effect the operation of any SO₂ removal system, SO₂ concentration measurement device or gas flow measurement device; and

(C) Decrease the concentration of SO₂ in gases exhausted from the sinter machine and zinc roasters which will have the effect of circumventing the requirements of paragraph (b)(2)(ii) of this section. The owner(s) or operator(s) must promptly inform the Administrator of any substantial changes in process gas flow which may affect the performance of any SO₂ removal facility or measurement device, regardless of the purpose for any such change.

(iv) *Continuous Monitoring.* The owner(s) or operator(s) shall install and calibrate, and shall thereafter maintain, operate and periodically test measurement systems for continuously monitoring and recording SO₂ emission concentrations, gas volumetric flow rates and gas flow indication in accordance with paragraph (b)(4)(ii) of this section for the monitoring equipment listed and at the following locations:

(A) Continuously operated SO₂ emission concentration and gas volumetric flow rate monitors and recorders located immediately downstream of each acid plant such that the measurement system measures only the tailgas from one acid plant;

(B) Continuously operated SO₂ concentration and gas volumetric flow rate monitors and recorders located in the zinc plant main stack;

(C) Continuously operated SO₂ concentration and gas volumetric flow rate monitors and recorders located in the lead smelter main stack and the lead smelter acid plant (upstream of the acid plant converter);

(D) Continuously operated gas flow indicating devices which will indicate and record the presence of gas flow in any duct or outlet from the sinter machine where SO₂ gas streams normally treated in an SO₂ removal facility may be bypassed around such facility and be routed to the atmosphere;

(E) Continuously operated gas flow indicating devices which will indicate and record the presence of gas flow in each of the individual five ducts receiving the bypass exhaust gas from zinc roasters #1 through #5. Each device must be located to monitor the bypass from only one roaster;

(F) Continuously operated gas flow indicating devices which will indicate and record the presence of gas flow in any duct or outlet where a single zinc roaster or combination of zinc roasters exhaust gas streams may be bypassed around an acid plant and routed to the atmosphere; and

(G) Based on a finding that the monitoring equipment specified herein is reasonably deemed to be inadequate to provide for effective regulatory compliance the Administrator may require the owner(s) or operator(s) to install and continuously operate gas volumetric flow rate monitor(s) and recorder(s) in any duct or outlet where exhaust gas may be bypassed around the acid plant(s) and routed to the atmosphere. In the event that such a finding is made by the Administrator, the owner(s) or operator(s) agree to install and operate such continuous monitors on or before sixty (60) days after the owner(s) or operator(s) receive such written notification by the Enforcement Division Director of Region X-EPA.

(v) *Continuous Process Monitoring.* The owner(s) or operator(s) shall install and calibrate, and shall thereafter maintain, operate and periodically test measurement systems for continuously monitoring and recording process parameters for the monitoring equipment listed and at the following locations:

(A) Continuous temperature monitors located to measure and record the inlet gas temperature at the first and third catalyst beds of each sulfuric acid plant;

(B) Continuously operated monitors which will detect and record the commencement and cessation of concentrate feed entering each zinc roaster. The recorded data from such monitors shall be printed on the same chart as used to record bypass gas flow in paragraph (b)(1)(iv) (E) and (F) of this section from each individual zinc roaster; and

(C) Continuously operated monitor which will detect and record the commencement and cessation of concentrate feed entering the sinter machine. The recorded data from such monitor shall be printed on the same chart as used to record bypass gas flow in paragraph (b)(1)(iv)(D) of this section from the sinter machine; and

(vi) *Fugitive SO₂ Emissions.* The owner(s) or operator(s) shall utilize best engineering techniques to capture and vent such fugitive SO₂ gases through stacks serving the facility. Such techniques shall include but not be limited to:

(A) Maintaining and operating all ducts, flues and stacks in a leak-free condition;

(B) Maintaining and operating all process equipment and gas collection systems in such a fashion that out-leakage of SO₂ gases will be prevented to the maximum extent possible;

(C) Instituting a program to reduce the fugitive emissions from the zinc roasters by reducing the frequency of positive pressure surges in the zinc roasters. This will be accompanied by component replacement, new fans, better operating practices, or other improvements to the integrity of the gas collection system as necessary to attain the Occupational Safety and Health Administration (OSHA) lead standard. This project will be completed on the dates required by the OSHA regulation to meet the lead workplace concentration standard. The estimated reduction in SO₂ fugitive emissions is approximately 8 tons per week and after treatment in an acid plant is expected to increase the total SO₂ emissions in the zinc smelter main stack by no more than 1 ton per week;

(D) Instituting a program to improve the draft maintained in the sinter machine hooding. This program will include increased maintenance on the strong and weak gas ducts, complete replacement of any mild steel hood material with stainless steel, excluding the last two hood sections which are not subject to high corrosion, and improvements in other system components to achieve 90 percent collection of the existing fugitive emissions estimated to be 4 tons of SO₂ per week. Part of these emissions will be treated in an acid plant so the increase in emissions through the lead smelter tall stack is estimated to be 3 tons of SO₂ per week. Such a program is expected to increase the total SO₂ emissions from the lead smelter main stack by no more than 3 tons per week; and

(E) Installing and operating a manual and if necessary automatically controlled tuyere air flow control system on both blast furnaces on or before June 11, 1980. The system is to be designed to eliminate over 90 percent of the current furnace upset conditions that result in fugitive SO₂ emissions. Such a program is expected to increase the total SO₂ emissions from the lead smelter main stack by no more than 21 tons per week. The program will be designed to reduce the frequency of blast furnace upset conditions to an aggregate total of less than 3.4 hours per week.

(F) Compliance with the fugitive SO₂ emission control program will be judged by Appendix A to this regulation.

(2) *Excess Emissions.* Effective on June 11, 1980, the owner(s) or operator(s) of the subject smelter shall comply with the requirements of paragraph (b)(2) of this section in regard to acid plant bypass, excess emissions and equipment malfunction. The requirements governing excess emissions during the annual acid plant maintenance period as set forth in paragraphs (b)(5) and (b)(6) of this section shall become effective on June 11, 1979.

(i) *Definition of Excess Emissions.* Any SO₂ emissions exceeding the limitations specified in paragraph (b)(1)(i) of this section above shall constitute an excess emission. SO₂ gas streams discharged to the atmosphere from any zinc plant roaster and from the strong gas exit point on the input end of the lead smelter sinter machine without being processed in an SO₂ removal facility shall also constitute an excess emission.

(ii) *Presumptively Excused Excess Emissions.* Where the owner(s) or operator(s) fully comply with the reporting requirements of paragraph (b)(2)(iv) of this section and further demonstrate that the conditions specified in paragraphs (b)(2)(ii) (A) through (E) of this section have been met, the bypass of SO₂ gas streams around an SO₂ removal facility shall be excused. Any excess emissions, whether or not claimed by the owner(s) or operator(s) to be excused excess emissions, may be deemed by the Administrator to violate this regulation where the owner(s) or operator(s) fail to comply with any requirement of paragraph (b)(2)(ii) of this section or upon a finding by the Administrator that the excess emissions claimed to be excusable by the owner(s) or operator(s) were caused by one or more of the conditions set forth in paragraph (b)(2)(v) (A) through (C) of this section. Excess emissions resulting from the following conditions are presumptively excused:

(A) *Process Shutdown Following Acid Plant Breakdown.* In the event of a breakdown or malfunction of an acid plant, the owner(s) or operator(s) may bypass the gas stream normally controlled by such acid plant, only for the time period necessary to shut down the process equipment (zinc roaster(s) or sintering machine) whose SO₂ streams would normally be controlled by such acid plant. Shutdown of the process equipment shall be initiated immediately and the time period to accomplish the shutdown and during which bypass is excused shall not exceed the following:

(1) 15 minutes for the sinter machine except where complete emptying of the

sinter belt is required the time period shall not exceed 60 minutes; and

(2) 30 minutes for shutdown of any single zinc roaster or combination of zinc roasters;

(B) *Process Shutdown Following Zinc Roaster Breakdown.* In the event of a breakdown or malfunction of a zinc roaster, the owner(s) or operator(s) may bypass the gas exhausted from that individual roaster around an acid plant and to the atmosphere commencing 5 minutes after concentrate feed ceases to enter such roaster;

(C) *Process Start-up Following Zinc Roaster Shutdown.* During the period when a zinc roaster is restarted following its shutdown the owner(s) or operator(s) may bypass the gas exhausted from that individual roaster around the acid plant and to the atmosphere only as follows:

(1) If either of the zinc plant acid plants is being restarted the owner(s) or operator(s) may bypass, around an acid plant and to the atmosphere, the roaster exhaust gas only for the time period necessary for a well designed, operated and maintained acid plant³ to establish autothermal⁴ operation; and

(2) If no acid plant is being restarted and if one or more zinc roasters is operating the owner(s) or operator(s) may bypass, around an acid plant and to the atmosphere, the exhaust gas from the individual roaster which is starting-up but only for the time period which ends 15 minutes after concentrate feed commences to enter such roaster;

(D) *Process Start-up Following Sinter Machine Shutdown.* In the event that the sinter machine has been shutdown, and upon its restart, the owner(s) or operator(s) may bypass the exhaust gas, around the acid plant and to the atmosphere, only as follows:

(1) If the sintering machine has been shutdown for greater than 3 hours bypass may occur but may not exceed the time period necessary for a well designed, operated and maintained acid plant to re-establish autothermal operation; and

³ As used in this regulation, in a well designed, operated and maintained acid plant the first catalyst bed must be at or be heated to a minimum temperature of 750°F before the zinc roaster (or sinter machine) the acid plant serves re-starts.

⁴ As used in this regulation the term "autothermal operation" is defined as the point in time when the temperature of gases entering the first catalyst bed in the acid plant converter is at 825°F or when the temperature of gases entering the third catalyst bed is at 750°F whichever comes first. The owner(s) or operator(s) shall insure that at any time an acid plant is started up sufficient gas will be routed to the acid plant as soon as possible to achieve autothermal operation. Further, the fan supplying gas to the lead smelter acid plant (Fan No. 6) shall upon start-up of the sinter machine immediately be brought up to full R.P.M. and operating logs maintained to document full RPM flow rate.

(2) If the sintering machine has been shutdown due to an acid plant component failure and the repair of the acid plant component takes longer than 3 hours bypass during restart of the sinter machine may occur. Such bypass may not exceed the time period necessary for a well designed, operated and maintained acid plant to re-establish autothermal operation;

(E) *Continued Process Operation During Annual Acid Plant Maintenance.* The owner(s) or operator(s) may bypass the process emissions around the acid plant and to the atmosphere during the annual acid plant maintenance period only to the extent allowed by paragraphs (b)(5) and (b)(6) of this section;

(iii) *Other Excess Emissions.* The owner(s) or operator(s) may in the required excess emission report of paragraph (b)(2)(iv) of this section claim that excess emissions should be deemed by the Administrator to be excusable. Any excess emission claimed to be excusable under this paragraph (b)(2)(iii) of this section shall be a violation of this regulation unless and until the owner(s) or operator(s) demonstrate to the satisfaction of the Administrator that such excess emission should be excused. For the purpose of illustration, cited below are categories of other excess emissions which may be excused:

(A) Bypass of gas around SO₂ removal facilities where necessary to prevent loss of life, personal injury or severe property damage. (Severe property damage does not include economic losses caused by production losses such as those caused by shut down of the blast furnace or electrolytic zinc processes due to lack of feed material.); and

(B) Sudden and unavoidable excess acid plant tailgas SO₂ emissions which are beyond the control of the owner(s) or operator(s). However, excess emissions shall not be deemed beyond the control of the owner(s) or operator(s) if caused by one or more of the following:

(1) Improperly designed acid plant components;

(2) Improperly operated process(es) or acid plant equipment;

(3) Inadequate maintenance of acid plant and/or gas cleaning systems; and

(4) In general, any fluctuations in volume or SO₂ concentrations of the acid plant feed gas.

(iv) *Excess Emission Report.* For any excess emissions, including those covered in paragraphs (b)(2)(ii) and (b)(2)(iii) of this section the owner(s) or operator(s) shall submit an initial report to the Enforcement Division Director of

the EPA—Region X. The report shall be submitted monthly within fifteen (15) days from the last day of the prior month. The owner(s) or operator(s) shall also record and maintain other supplemental information as set forth in paragraph (b)(2)(iv)(B) of this section.

(A) The initial report shall contain the following information:

(1) Identify of the gas stream, stack or other point where the excess emissions occurred;

(2) General magnitude of the excess emissions;

(3) Time and duration of the excess emissions;

(4) Nature and cause of such excess emissions; and

(5) Identity of the equipment causing the excess emissions;

(B) The supplemental information shall include the following and if requested be provided to the Enforcement Division Director of EPA—Region X within thirty (30) days of request:

(1) Specific steps taken by the operator(s) to limit the excess emissions and when those steps were commenced;

(2) If the excess emissions were the result of equipment malfunction, the steps taken to remedy the malfunction and to prevent the recurrence of such malfunction;

(3) Specific magnitude of the excess emissions including monitoring data and calculations which describe or may be used in determining the magnitude of the excess emissions;

(4) Maintenance schedules applicable to the equipment causing the excess emissions;

(5) Copies of properly signed contemporaneous operating log sheets; and

(6) Other related documentation as may be reasonably required by the Director to assist him in the evaluation of the excess emissions including any information necessary to make the determinations set forth in paragraph (b)(2)(v) of this section.

(C) Failure of the owner(s) or operator(s) to provide the EPA with a full and complete excess emissions report within a timely fashion, shall constitute a violation of this regulation.

(v) *Evaluation of Excess Emission Report.* In evaluating the excess emissions, the Enforcement Division Director shall take into consideration, the following:

(A) Whether the air pollution control systems and process equipment were at all times maintained and operated, to the maximum extent practicable, in a manner consistent with best practice for minimizing emissions;

(B) Whether the amount and duration of the excess emissions were minimized to the maximum extent practicable during periods of such emissions, and process equipment was shut down within the shortest reasonable time after the SO₂ removal facility shut down occurs; and

(C) Whether the excess emissions were part of a recurring pattern indicative of serious deficiencies in, the design, operation or maintenance of, the process(es), the gas cleaning equipment or the SO₂ removal facility, including whether prescribed maintenance schedules were followed.

(vi) Nothing in this subsection shall be construed to limit the authority of the Administrator to take any action under Section 303 of the Clean Air Act.

(3) *Supplementary Control System.* Effective on June 11, 1979, the owner(s) or operator(s) of the subject smelter, in addition to meeting the SO₂ capture requirements of paragraph (b)(1) of this section shall employ a supplementary control system (SCS) to the extent necessary to meet National Ambient Air Quality Standards (NAAQS) for SO₂ and such other additional control measures as may be necessary, to assure the attainment and maintenance of NAAQS for SO₂. The requirements applicable to the SCS program and meeting ambient air quality standards are as follows:

(i) *SCS Analysis.* On January 18, 1979, the Administrator provided the owner(s) or operator(s) with a copy of an EPA technical analysis of the existing SCS program detailing deficiencies in such program;

(ii) *Final SCS Program.* Except during the interim period as provided in paragraph (b)(3)(vii) of this section, the final SCS program shall be conducted in accordance with the provisions of an SCS implementation plan and an SCS operational manual, both of which must be approved by the Administrator. The SCS implementation plan shall describe the administrative requirements, personnel staffing, components and equipment of the SCS system. The SCS manual shall describe the circumstances under which, the extent to which, and the procedures through which emissions shall be curtailed to prevent violations of the NAAQS for SO₂. Process SO₂ emission shall be curtailed in accordance with the SCS operating manual whenever the potential for violating any NAAQS for SO₂ is indicated at any point in a designated liability area (as defined in paragraph (b)(3)(v) of this section) by air quality measurements and air quality predictions;

(iii) *The SCS Implementation Plan.* An approvable SCS implementation plan shall contain (but not be limited to) the following:

(A) A detailed description of the emission monitoring system and the continuous SO₂ monitoring network that will be used in the SCS to detect maximum ground-level SO₂ concentrations in the designated liability area (DLA). Such description must specify the number, type and exact location of each SO₂ monitor and in-stack monitor to be used. An approvable monitoring system/network must include the following:

(1) Except as provided in paragraph (b)(3)(viii)(C) of this section, the continuous SO₂ monitoring equipment shall be located at all ambient air ⁵ points of expected maximum ground-level SO₂ concentrations in the DLA provided that if deemed necessary to guarantee attainment and maintenance of standards, monitors may be located in other locations with the approval of the Administrator. The determination of the locations where maximum concentrations may occur shall take into account all reasonably probable meteorological and process operating conditions, as well as the presence of other sources of SO₂ significantly affecting SO₂ concentrations in the DLA;

(2) The number and location of sites shall be based on dispersion modeling, measured ambient air quality data, meteorological data and other meteorological information;

(3) The system shall include the use of fixed SO₂ ambient monitors and one mobile monitor to be sited as, from time to time, the EPA—Region X may reasonably direct unless the Administrator determines, on the basis of a demonstration by the owner(s) or operator(s), that the use of fewer monitors would not limit coverage of points of maximum concentration or otherwise reduce the capability of the owner(s) or operator(s) to prevent any violations of the NAAQS in the DLA; and

(4) All monitors shall be continuously operated and maintained and shall meet the performance specifications contained in 40 CFR Part 53. The monitors shall be capable of routine real time measurement of maximum expected SO₂ concentrations for the averaging times of SO₂ NAAQS.

(B) A detailed description of the meteorological sensing network. Such description must specify the number,

⁵ As used in this regulation the term "ambient air" shall be defined in the same manner as that term is defined in the Clean Air Act and regulations promulgated thereunder.

type and exact location of each meteorological instrument to be used. An approvable network must have an assessment capability adequate to identify conditions requiring emission curtailment to prevent possible violations of the NAAQS. The meteorological assessment capability shall provide all forecast and current information necessary for successful use of the system's operational manual;

(C) A program whereby the owner(s) or operator(s) systematically evaluates and improves the ability of the SCS to protect against violations of the NAAQS. Such program must be based upon the information contained in the EPA Guideline Document—OAQPS 1.2-036; and

(D) A clear delineation of authority delegated to an appropriate named company official to require all other smelter personnel to comply with the SCS operator's curtailment decisions. The identity of responsible and knowledgeable on-site company personnel who are the qualified SCS operators and are authorized to initiate and supervise the actions that will be taken to curtail emissions shall be listed; such personnel must, upon request, be able and be authorized by the Company to inform the Administrator as to the status of the SCS, meteorological and air quality conditions at any time and whether and to what extent the recommendations or determinations of the SCS operator(s) were followed or overridden by any Company official in making any curtailment or operating decision;

(iv) *The SCS Operating Manual.* An approvable operational manual shall require operation of the SCS to include (but not be limited to) the following:

(A) Prescribed emission curtailment decisions based on the use of real time information from the air quality monitoring network, dispersion model estimates of the effect of SO₂ emissions on air quality, and meteorological observations and predictions;⁶

(B) The maintenance and calibration procedures and schedules for all SCS equipment;

(C) The procedures to be followed for the regular acquisition of all meteorological information necessary to operate the system;

(D) The ambient concentrations and meteorological conditions that shall be used as criteria for initiating various degrees of non-discretionary emission curtailment;

(E) The meteorological variables including the thresholds, ranges and combinations of values as to which judgments may be made to anticipate the onset of, and apply, the criteria stated in paragraph (b)(3)(iv)(D) of this section. Specifically, the maximum emission rates which may prevail under each of these meteorological and air quality situations must be specified. Such emission rates shall be determined by in-stack monitors and shall be the basis for determining whether provisions of the operational manual are adhered to;

(F) The procedures through which and the maximum time period within which a curtailment decision will be made and implemented by the SCS operator;

(G) The method for immediately evaluating the adequacy of a particular curtailment decision, including the factors to be considered in that evaluation;

(H) The procedures through which and the time within which additional necessary curtailment will immediately be effected; and

(I) The procedures to be followed to protect the NAAQS for SO₂ in the event of a mechanical failure in any element of the SCS.

(v) *Designated Liability Area.* The DLA shall be the area within two circles, each with a radius of 10 statute miles (16 kilometers) with the center point of such circles coinciding, respectively, with the main stack serving the lead smelter and the main stack serving the zinc plant. If new information becomes available which demonstrates that the DLA should be redefined, the Administrator shall consider such information and if appropriate, redefine the DLA.

(vi) *Consent to Liability.* On or before July 11, 1979, the owner(s) or operator(s) shall submit to the Administrator an affidavit signed by a responsible company official, empowered to do so, stating that in any judicial or administrative proceeding to enforce this regulation the owner(s) will accept responsibility for violations of the NAAQS for SO₂ in areas of ambient air in the DLA as defined by paragraph (b)(3)(v) of this section

(vii) *Interim Conduct of SCS Program.* Until the Administrator approves under paragraph (b)(3)(x) of this section a revised SCS implementation plan and a revised SCS operational manual required under paragraph (b)(3)(ix)(C) of this section, the owner(s) or operator(s) shall conduct the SCS program in accordance with the existing SCS operational manual and the existing SCS implementation plan which has been approved by the Director of the State of

Idaho Department of Health and Welfare (IDHW): *Provided*, That, upon execution of the consent to liability as required by paragraph (b)(3)(vi) of this section, the existing manual and plan shall be deemed modified by such consent.

(viii) *Study Regarding NAAQS.* Within the times specified by paragraph (b)(3)(ix) of this section, the owner(s) or operator(s) shall submit a study to EPA—Region X which accomplishes the following:

(A) Demonstrates that the NAAQS for SO₂ are being met in all areas of ambient air within the DLA surrounding the smelting complex;

(B) Corrects the deficiencies in the existing SCS operational manual and SCS implementation plan described in the EPA technical study of the present SCS program as described in paragraph (b)(3)(i) of this section or documents that the EPA study erroneously described such deficiencies;

(C) Demonstrates that ambient SO₂ monitors are located (or will be located) in all areas of maximum expected ambient SO₂ concentrations that take into account all probable meteorological and operating conditions. For specific locations of maximum expected ambient SO₂ concentrations, if the owner(s) or operator(s) can demonstrate in the study that maximum ground-level SO₂ concentrations can be predicted through use of alternate techniques then SO₂ ambient monitors may not have to be placed at each such respective location: *Provided*, That such respective localities are inaccessible. "Alternative techniques" as used here shall be deemed to be a demonstration through SO₂ monitoring and calibrated modelling techniques that the compliance status of each unmonitored location of maximum expected SO₂ concentration will be accurately determined from data collected at an alternative monitoring site; and

(D) Failure to timely submit an approvable study shall constitute a violation of this regulation.

(ix) *Required Submissions.* The following items must be submitted to the Administrator within the time limitations shown:

(A) Within two (2) months following the date of promulgation of the final NSO regulations under Section 119 of the Act, the owner(s) or operator(s) shall submit a study plan for the study required by paragraph (b)(3)(viii) of this section; within one (1) month following receipt of such plan the Administrator will provide comments to the owner(s) or operator(s) on such study plan;

(B) Within five (5) months following the date of promulgation of the final

⁶ The intent behind this subparagraph is set forth in Subpart D of the recently proposed NSO regulations (44 FR 6283; 6290-6291 [January 31, 1979] and 44 FR 11096; 11097 [February 27, 1979]).

NSO regulations under Section 119 of the Act, the owner(s) or operator(s) shall submit a final study plan for the study required by paragraph (b)(3)(viii) of this section which incorporates the EPA comments described in paragraph (b)(3)(ix)(A) of this section;

(C) Within one (1) year following the date of promulgation of the final NSO regulations under Section 119 of the Act or the final tall stack regulations under Section 123⁷ of the Act (whichever is later), the owner(s) or operator(s) shall submit to the Administrator the NAAQS attainment and SO₂ ambient monitor placement study required by subparagraph (b)(3)(viii);

(D) Within eighteen (18) months following the date of promulgation of the final NSO regulations under Section 119 of the Act or the final tall stack regulations under Section 123 of the Act (whichever is later), the owner(s) or operator(s) shall submit to the Administrator an approvable SCS implementation plan and an approvable SCS operational manual which accomplishes the following:

(1) takes into account the placement of SO₂ ambient monitors in the areas of maximum expected ambient SO₂ concentrations, as specified by paragraph (b)(3)(viii)(B) of this section; and

(2) Incorporates the requirements of paragraphs (b)(3)(iii) and (b)(3)(iv) of this section and which remedies the problems identified in the EPA technical study of the present SCS program as described in paragraph (b)(3)(i); and

(E) Within twenty-four (24) months following the date of promulgation of the final NSO regulations under Section 119 of the Act or the final tall stack regulations under Section 123 of the Act (whichever is later), the owner(s) or operator(s) shall submit to the Administrator a certification that placement of SO₂ ambient monitors is in accordance with paragraph (b)(3)(viii)(C) of this section.

(x) *Final Conduct of SCS Program.* Upon the Administrator's review and approval of the information submitted under paragraph (b)(3)(ix)(D) of this section, the owner(s) or operator(s) will be required to conduct the SCS program in accordance with a revised SCS operational manual and the revised SCS implementation plan approved herein. Failure of the owner(s) or operator(s) to timely submit an approvable study plan, study, SCS implementation plan or SCS operational manual will constitute a violation of this regulation.

(xi) *SCS Violations.* During the interim conduct of the SCS program as discussed in paragraph (b)(3)(vii), failure to curtail SO₂ emissions when and as much as indicated by the applicable SCS operational manual or to follow the provisions of the applicable SCS manual and SCS implementation plan shall constitute a violation of this regulation if the NAAQS for SO₂ are exceeded as a result of such failure. Upon commencement of the final SCS program as discussed in paragraph (b)(3)(x) of this section, failure to curtail SO₂ emissions when and as much as indicated by the revised SCS operational manual or to follow the provisions of the revised manual and SCS implementation plan shall constitute a violation of this regulation. Any violation of the NAAQS for SO₂ in the DLA shall be a violation of this regulation unless EPA determines on the basis of a showing by the owner(s) or operator(s) that:

(A) The smelter owner(s) or operator(s) had taken all emission curtailment action indicated by the SCS operational manual; and

(B) The violation was caused in significant part by emissions of another source(s) which were in excess of the maximum permissible emissions applicable to such source(s).

(xii) *Continuing Review of the SCS Program.* The owner(s) or operator(s) shall continuously review the design and operation of the SCS program to determine what measures may be available for improving the performance of the system. An annual report shall be submitted to the Administrator by March 1 of each calendar year detailing the results of this review and specifying measures implemented to prevent the recurrence of any ambient SO₂ violations.

(4) *Monitoring, Compliance Reporting and Compliance Determination.* Effective on June 11, 1979, the owner(s) or operator(s) of the subject smelter shall comply with the requirements of paragraph (b)(4) of this section in regard to monitoring, compliance reporting and compliance determination except where such requirement is to be met in accordance with a separate compliance schedule provided for by this regulation:

(i) *SCS Program.* For the SCS program, the owner(s) or operator(s) shall:

(A) Maintain, in a useable manner, records of all air quality measurements made, meteorological information acquired, and emission curtailments ordered (including the identity of the persons making such decisions) during the operation of the SCS. Such records shall be retained for at least two years; and

(B) Submit to the Administrator, on a monthly basis, within fifteen (15) days after the end of each month, all measurements made of air quality and all other information regarding the SCS program that the Administrator may request. Such submission shall include a monthly summary indicating all dates and times when a NAAQS for SO₂ was exceeded or equaled in the DLA.

(ii) *Compliance Monitoring.* For compliance monitoring, the owner(s) or operator(s) shall:

(A) *SO₂ Concentration Monitors.* Install, operate and maintain SO₂ concentration measurement system(s) in accordance with the performance specifications and other requirements contained in Appendix D to 40 CFR Part 52, and the conditions outlined as follows:

(1) All SO₂ monitors shall be operated continuously and each monitor shall take and record at least one measurement^{*} of SO₂ concentration in each 15 minute period;

(2) The sampling point shall be located at least 8 stack diameters (diameter measured at sampling point) downstream and 2 diameters upstream from any flow disturbance such as a bend, expansion, constriction, or flame, unless another location is approved by the Administrator;

(3) The sampling point for monitoring emissions shall be in the duct at the centroid of the cross section if the cross sectional area is less than 4.645m² (50 ft²) or at a point no closer to the wall than 0.914m (3 ft.) if the cross sectional area is 4.645m² (50 ft²) or more. The monitor sample point shall be in an area of small spatial concentration gradient and shall be representative of the concentration in the duct; and

(4) The SO₂ concentration measurement system(s) shall be subject to the manufacturer's recommended zero adjustment and calibration procedures at least once per 24-hour operating period unless the manufacturer specifies or recommends calibration at shorter intervals, in which case such specifications or recommendations shall be followed. Records of these procedures shall be made which clearly show instrument readings before and after zero adjustment and calibration.

(B) *Gas Volumetric Flow Rate Monitors.* Install, operate and maintain gas volumetric flow rate system(s) in

⁷ These Section 123 tall stack regulations were proposed in the Federal Register on January 12, 1979 (44 FR 2,608).

^{*} In the event SO₂ measurements cannot be recorded because monitoring equipment was out-of-service for periodic zero adjustment and calibration or maintenance an arithmetic mean shall be used to determine SO₂ concentration for a given time interval. 75% of the required data will be considered sufficient to calculate a valid arithmetic average.

accordance with the performance specifications and other requirements contained in Appendix E to 40 CFR Part 52 and the conditions outlined as follows:

(1) The monitors are to be operated on a continuous basis and must be located at least 8 stack diameters (diameter measured at sampling point) downstream and 2 diameters upstream from any flow disturbance such as a bend, expansion, constriction, or flange, unless another location is approved by the Administrator.

(2) The sampling point within the duct shall be representative of the average flow in the duct or at the point specified by the instrument manufacturer.

(3) The instrument used to monitor SO₂ gas streams which bypass the lead smelter acid plant shall be adequate to disclose the time of the bypass and its duration.

(4) The measurement system(s) shall be subjected to the manufacturer's calibration procedures at intervals recommended by the manufacturer. Records of these procedures shall be made which clearly show instrument readings before and after any adjustments. If manufacturers calibration procedures do not exist procedures will be specified by the EPA.

(C) *Gas Flow Indicating Devices.* Install, operate, and maintain a system to detect the occurrence of situations when any gas is bypassed around an acid plant as specified in paragraph (b)(1)(iv) of this section in accordance with the following conditions:

(1) The system design for detecting gas flow shall be approved by the Enforcement Division Director of the EPA Region X;

(2) The device shall be located in each flue or duct where gas may bypass an acid plant;

(3) The system shall be capable of detecting gas flows as low as 5 percent of the maximum expected flow through each duct; and

(4) The system shall be continuously operated and capable of disclosing and recording the time of the bypass and its duration.

(D) *Field Test.* All continuously operated instrumentation required herein shall be field tested after installation. If field test requirements are not specified by the manufacturer EPA will provide test requirements. The Administrator shall be notified at least twenty (20) days prior to that start of the field test period, to afford the Administrator the opportunity to have an observer present.

(E) *Certification of Monitors.* With the exception of the 168 hour break-in period for the SO₂ concentration

measurement system(s), all SO₂ concentration and gas volumetric flow rate and gas flow indicating system(s) shall be recertified by the owner(s) or operator(s) at reasonable intervals as requested by the Administrator but in no case less frequently than once per year. The Administrator shall be notified in writing at least twenty (20) days prior to any tests associated with this requirement so that he may have an observer present. A report of the results of each test shall be forwarded to the Administrator within sixty (60) days of the completion of each test;

(F) *Continuous Data Recorder.* The equipment utilized to record the data and parameters measured by continuous monitoring instrumentation shall meet the following requirements or alternate equivalent requirements as the Administrator may require:

(1) Where various parameters are recorded on one strip chart the data must, to the Administrator's satisfaction, be continuously traced and each trace be individually and continuously identifiable when the chart is reproduced. In the event a color coded system of data recording is utilized copies of strip chart recordings submitted to the EPA must also be color coded or include a mathematically reduced tabulation of the data on at least 15 minute intervals;

(2) The scale for all SO₂ concentration readings must be set so that the maximum expected readings will be at least 40 percent of full scale;

(3) The scale for all gas volumetric flow readings must be set so that the maximum expected readings will be at least 80 percent of full scale; and

(4) Other requirements regarding data reduction and recording may be specified by the Administrator as required to enforce this regulation.

(G) All SO₂ concentration, gas volumetric flow rate and gas flow indicating measurement and recording instruments shall be maintained on operational mode and one line at all times except that provision will be made excusing the owner(s) or operator(s) from monitoring during periods when monitors break down due to causes beyond the control of the owner(s) or operator(s). In such an event, the owner(s) or operator(s) shall notify the Administrator within three (3) days of such a break down and provide information as to actions taken during the instrument malfunction period. All strip chart recordings of the instrumentation of paragraphs (b)(1)(iv) and (b)(1)(v) of this section must be marked once per shift as to the actual time a selected recorded measurement is being recorded. Quality assurance

checks shall be performed on all continuous monitoring instrumentation at the frequency specified by the manufacturer or as otherwise reasonably required by the Administrator;

(H) Maintain, in a useable manner, process strip chart recordings, records of all measurements accumulated by the continuous monitoring systems of paragraph (b)(1)(iv) and (b)(1)(v) of this section and compliance determination calculations (measurements) of paragraph (b)(4)(iii) of this section below. Such information shall be retained for at least two (2) years. The Administrator or his authorized representative shall have reasonable access to these records; and

(I) Maintain, in a useable manner, process strip chart recordings, records and operators log sheets of plant operations for a period of at least two (2) years. The Administrator or his authorized representative shall have reasonable access to these records.

(iii) *Compliance Determination.* For compliance determination, the following shall apply:

(A) *Acid Plant Tailgas—Continuous Monitors.* Compliance with the requirements of paragraph (b)(1)(i)(A) of this section shall be determined using the continuous measurement system(s) of paragraph (b)(1)(iv) of this section installed, calibrated, maintained and operated in accordance with the requirements of paragraph (b)(4)(ii) of this section. An hourly running 6-hour averaging period shall commence at each clock hour and continue for a consecutive 6 clock hour period. A new hourly running 6-hour averaging period will commence at every clock hour. For example, in a given day the following typical hourly running 6-hour averaging periods will occur: 2 a.m. to 8 a.m.; 3 a.m. to 9 a.m.; 4 a.m. to 10 a.m.; and 5 a.m. to 11 a.m. *et seq.* Six-hour average SO₂ concentration shall be calculated as of the end of each clock hour for the preceding 6 hours, in the following manner:

(1) Divide each 6-hour period into not less than twenty-four (24) equally spaced time intervals;

(2) Determine on a compatible basis an SO₂ concentration for each individual time interval.⁹ These measurements may be obtained either by continuous integration of all measurements recorded during the time interval or from the arithmetic average of any number of SO₂ concentration readings equally spaced over the time interval. In the latter case, the same number of concentration readings shall be taken in

⁹Supra note 7.

each interval and the readings shall be similarly spaced within each interval; and

(3) Calculate the arithmetic average of all interval concentration measurements in each 6-hour period.

(B) *Acid Plant Tailgas—Manual Test.* Notwithstanding the requirements of paragraph (b)(4)(iii)(A) of this section, compliance with the requirements of paragraph (b)(1)(i)(A) of this section shall also be determined by using the methods described below at such times as may be reasonably specified by the Administrator. For any acid plant, a 6-hour average SO₂ concentration shall be determined as follows:

(1) The test of each acid plant tailgas SO₂ concentration shall be conducted while the acid plant is operating at or above the maximum rate at which it will be operated and under such other conditions as the Administrator may specify;

(2) Concentrations of SO₂ in emissions shall be determined by using Method 8 as described in 40 CFR Part 60. The analytical and computational portions of Method 8 as they relate to determination of sulfuric acid mist and sulfur trioxide as well as isokinetic sampling, may be omitted from the over-all test procedure;

(3) Three independent sets of measurements of SO₂ concentrations shall be conducted during three 6-hour periods for each acid plant. Each 6-hour period will consist of three consecutive 2-hour periods. All tests must be completed within a 72-hour period;

(4) In using Method 8, traversing shall be conducted according to Method 1 as described in 40 CFR Part 60. The minimum sampling volume for each 2-hour test shall be 1.132 M³ (40 ft³) corrected to standard conditions, dry basis;

(5) The velocity of the total effluent from each acid plant evaluated shall be determined by using Method 2 as described in 40 CFR Part 60 of this chapter and transversing according to Method 1. Gas analysis shall be performed by using the integrated sample technique of Method 3 as described in 40 CFR Part 60. Moisture content shall be determined by using Method 4 except that stack gases arising only from a sulfuric acid production unit may be considered to have zero moisture content;

(6) The gas sample shall be extracted at a rate proportional to gas velocity at the sampling point;

(7) The SO₂ concentration in parts per million-maximum 6-hour average for each stack is determined by calculating the arithmetic average of the results of the three 6-hour test period each consisting of three 2-hour tests; and

(8) When necessitated by process variables or other factors, changes to the above test procedures may be approved by the Administrator.

(C) *7-Day Emissions—Continuous Monitoring.* Compliance with the requirements of paragraph (b)(1)(i)(B) of this section shall be determined using the continuous measurement system(s) of paragraph (b)(1)(iv) of this section installed, calibrated, maintained and operated in accordance with the requirements of paragraph (b)(4)(ii) of this section. A daily running 7-day period shall commence at midnight of each day and continue for a consecutive 7-day period. A new daily running 7-day period will commence at midnight of every day. For example, in a given week the following typical daily running 7-day periods will occur: Tuesday (0000 hours) to Monday (2400 hours); Wednesday (0000 hours) to Tuesday (2400 hours) and Thursday (0000 hours) to Wednesday (2400 hours), *et seq.* The SO₂ emission rate for a 7-day period shall be calculated on a daily basis (midnight to midnight) in the following manner:

(1) Divide each 6-hour period into not less than twenty-hour (24) equally spaced time intervals;

(2) Determine on a compatible basis an SO₂ concentration and a stack gas flow rate measurement for each individual time interval for each affected stack.¹⁰ These measurements may be obtained either by continuous integration of SO₂ concentration and stack gas flow rate measurements (from the respective affected facilities) recorded during the time interval or from the arithmetic average of any number of SO₂ concentration and stack gas flow rate readings equally spaced over the time interval. In the latter case, the number of concentration readings shall be taken in each time interval and the readings shall be similarly spaced within each time interval;

(3) Calculate the arithmetic average (pounds SO₂ per hour) of all interval emission rate measurements in each 6-hour period for the zinc plant main stack and the lead smelter main stack and multiply that arithmetic average by the number of time intervals in the 6-hour period; and

(4) Calculate the SO₂ emission rate for each consecutive 7-day period (midnight to midnight) by summing the twenty-eight (28) 6-hour average SO₂ emission rates for each stack measured over a 7-day period.

(D) *Miscellaneous Source SO₂ Emissions.* The owner(s) or operator(s) shall perform a manual source test of the SO₂ emissions from the zinc fuming

furnace and any other SO₂ emitting process equipment whose SO₂ emissions are not routed through the zinc plant main stack or lead smelter main stack. These emissions will not be used in calculating the 7-day SO₂ emissions as described in paragraph (b)(4)(iii)(c) above but must be submitted to the Administrator on an annual basis. The following shall apply to the performance of the manual source test:

(1) Manual source test methods shall be in accordance with the procedures contained in Appendix A to 40 CFR Part 60 and as follows:

(i) SO₂ emissions shall be measured by Method 8 sampling train; 3 runs of at least 60 minutes sampling time per run will constitute one manual source test. The minimum sampling volume for each 1-hour test shall be 1.15 m³ (40.6 ft³) corrected to standard conditions, dry basis. The analytical and computational portions of Method 8 as they related to determination of sulfuric acid mist, as well as the isokinetic sampling, may be omitted from the overall test procedure.

(ii) Sampling will be conducted at a rate proportional to gas velocity determined according to Methods 1 and 2.

(iii) Two gas samples will be collected during each sampling run, according to Method 3.

(iv) Moisture content of the gas stream will be determined from the weight gain of the Method 8 train impingers.

(v) When necessitated by process variables or other factors, changes to the above test procedures may be approved by the Administrator.

(2) Source tests shall be conducted on or before (twelve months following execution of this Agreement) and at intervals specified by the Administrator but in any event not less than once per year;

(3) The process(es) tested shall be operated at or above the maximum rate at which it will be operated during the year and under such other conditions as the Administrator may specify; and

(4) The Administrator shall be notified in writing at least twenty (20) days prior to any such test so that he may have an observer present.

(5) *Research and Development Program.* Commencing on June 11, 1979, the owner(s) or operator(s) of the subject smelter shall comply with the requirements of paragraph (b)(5) of this section in regard to research and development. The provisions of this paragraph are intended to be read together with those set forth in paragraph (b)(6) of this section regarding bypass of SO₂ streams during the annual acid plant maintenance period:

¹⁰ *Supra* note 7.

(i) *Full Scale Research and Development Program.* Except as provided in paragraph (b)(5)(iii) of this section, the owner(s) or operator(s) shall implement a full scale program to capture and control an SO₂ gas stream which was not controlled as of September 28, 1978. A qualifying program shall meet the requirements of paragraphs (b)(5)(ii), (iv), (v), (vi), (vii) and (viii) of this section, and shall consist of one of two options:

(A) An SO₂ removal facility (flue gas desulfurization system) to capture the weak stream exhausted from the sinter machine; or

(B) Substantially complete recirculation of the sinter machine weak stream" and treatment of the resultant gas stream in an SO₂ removal facility.

(ii) *Fuel Scale System Design Criteria.* The following shall constitute the design criteria for the full scale research and development system:

(A) Sinter machine weak stream flue gas desulfurization system:

(1) 95 percent SO₂ capture efficiency as determined by monitoring equipment continuously measuring feed gas SO₂ concentration and tail gas SO₂ concentration; and

(2) 95 percent on-line availability;

(B) Substantially complete sinter machine weak stream recirculation:

(1) Not less than 97 percent partitioning of SO₂ generated in the machine shall be routed to an SO₂ removal facility;

(2) Not more than 3 percent partitioning of the SO₂ gas generated in the machine shall be routed to the atmosphere via the tip end gas stream; and

(3) The SO₂ capture efficiency of the SO₂ removal facility shall not be impaired because of the additional gas captured through utilization of weak stream recirculation.

(iii) *Reduced Scale Research and Development Program.* The owner(s) or operator(s) may elect not to perform the full scale research and development program as set forth in paragraph (b)(5)(i) of this section: *Provided, That:*

(A) The owner(s) or operator(s) notify the EPA—Region X, in writing, of such decision no later than June 11, 1980, and provide a detailed account of the reasons for rejection of the full scale research and development program, including all cost and design information considered in the decision;

(B) The owner(s) or operator(s) immediately submit for the

Administrator's approval a substitute research and development program, consisting of construction and operation of a flue gas desulfurization system with a minimum volume operating capacity of 5000 SCFM to treat a portion of the weak gas exhausted from the sinter machine or blast furnace;

(C) Such flue gas desulfurization system is constructed and operated in accordance with the requirements of paragraphs (b)(5)(iv), (v), (vi), and (viii) of this section within the time periods specified in paragraph (b)(5)(vii) of this section. The following shall constitute the design criteria for the reduced scale research and development system:

(1) 95 percent SO₂ capture efficiency as determined by monitoring equipment continuously measuring feed gas SO₂ concentration and tailgas SO₂ concentration;

(2) 95 percent on-line availability;

(3) Continuous measurement instrumentation to monitor and record the following:

(i) System temperatures, pressures and gas and liquid flow rates;

(ii) Feed gas and tailgas SO₂ concentration;

(iii) Pressure drop within the system, and

(iv) pH and all other critical flue gas desulfurization operating parameters such as liquid make-up and recirculation flow rates;

(4) To the extent technically feasible sufficient automatic control instrumentation shall be provided such that the system automatically compensates for feed gas excursions in particulate loading, flow rate and SO₂ concentration while insuring minimum design criteria are maintained; and

(5) To the extent technically feasible system design and control should be such that correct chemical balance is maintained to avoid scaling, corrosion and equipment malfunction.

(D) The flue gas desulfurization system shall be operated continuously, except during periods of reasonably unavoidable equipment failure in accordance with good engineering practice and in a manner such that the project will result in the collection of information adequate to determine the economic and technological feasibility of a full scale application of such flue gas desulfurization system.

(iv) *Evaluation of the Research and Development Program.* Effective on June 11, 1979, the owner(s) or operator(s) shall evaluate the research and development program and prepare and submit an annual report to the Administrator by March 1 of each calendar year on the progress of the

research and development project and detailing the following:

(A) Capital, operating and other costs of the system;

(B) Disposal of by-products (or waste material) and associated environmental impact;

(C) Energy utilization and related potential effects on energy conservation;

(D) The effectiveness of the system to improve capture of other pollutants of both occupational and environmental significance;

(E) Problems in system design and suggested methods or actual methods undertaken to improve the design including any anticipated scale-up problems;

(F) Maintenance requirements and frequency of system shutdown;

(G) Personnel staffing requirements;

(H) SO₂ capture efficiency as impacted by process exhaust gas fluctuations and sinter machine (or blast furnace) shutdowns; and

(I) Such other related technical information as may be reasonably required by the Administrator to assist him in the evaluation of the research and development program.

(v) *System Operation.* The owner(s) or operator(s) shall install and operate the full scale or reduced scale removal facility, whichever it elects, in accordance with good engineering practice and shall make a good faith effort to operate the project continuously, except for periods of reasonably unavoidable malfunction until the expiration date of the first primary non-ferrous smelter order or until discontinuance is authorized under paragraph (b)(6)(iii) of this section or by written authorization of the Administrator, and in such manner as will result in the collection of information necessary to determine the economic and technological feasibility of the facility. If technically feasible, system performance must be at the design criteria as specified in paragraphs (b)(5)(ii) or (b)(5)(iii) of this section subsequent to its initial break-in period.

(vi) *Sanctions.* Except where the owner(s) or operator(s) have first demonstrated to the satisfaction of the Administrator that due to technical infeasibility design criteria cannot be achieved, departure from the design criteria of paragraphs (b)(5)(ii) and (iii) (as applicable) above in the final construction or operation of the research and development program, or failure to meet the compliance schedule and reporting requirements, shall constitute a violation of this regulation.

(vii) *Research and Development Compliance Schedule.* The owner(s) or

"Nothing in this regulation shall be construed to relieve the owner(s) or operator(s) from meeting the requirements of the Clean Air Act or regulations promulgated thereunder regarding construction or modification requirements concerning new sources.

operator(s) shall comply with the following research and development program compliance schedule:

(A) Complete an engineering evaluation of the full scale and reduced scale research and development systems listed in paragraphs (b)(5)(i) and (b)(5)(iii) of this section and submit a complete report and data to the Administrator on or before June 11, 1980;

(B) Notify the Administrator of the research and development system and the gas stream to be treated on or before June 11, 1980;

(C) Complete all engineering and design work on the research and development system on or before ten months following the notification of paragraph (b)(5)(vii)(B) of this section but in any event not later than April 11, 1981. The Administrator shall be provided with a copy of the engineering design for the technique selected;

(D) Award construction contracts for the SO₂ capture system on or before fourteen months following the notification of paragraph (b)(5)(vii)(B) of this section but in any event not later than August 11, 1981. Such award shall be contingent upon a primary non-ferrous smelter order first being issued to the owner(s) or operator(s);

(E) If the full scale research and development system is selected, complete construction of the SO₂ capture system and begin acceptance testing on or before March 11, 1982; and complete all start-up and acceptance testing of the SO₂ capture system and place such system in service by June 11, 1982; and

(F) If the reduced scale research and development system is selected, complete construction of the flue gas desulfurization system by December 11, 1981, and place such system in service by February 11, 1982.

(viii) *Consent to Access.* The owner(s) or operator(s) shall submit a binding written agreement, signed by a responsible corporate official empowered to do so consenting to:

(A) Grant the representatives and contractors of the EPA access to any information or data employed or generated in the research and development program, including any process, emissions, or financial records which the EPA determines are needed to evaluate the technical or economic merits of the program;

(B) Grant physical access to the representatives and contractors of the EPA to each facility at which such research is conducted; and

(C) Grant the representatives and contractors of the EPA reasonable access to the persons in charge of conducting the program on behalf of the

smelter owner for discussions of progress, interpretation of data and results, and any other similar purposes as deemed necessary by the EPA.

(6) *Annual Acid Plant Maintenance Offset.* Commencing on June 11, 1979, the owner(s) or operator(s) of the subject smelter shall comply with the requirements of paragraph (b)(6) of this section in regard to continued process operation during the period when an acid plant is shutdown for annual maintenance.

(i) *Bypass Prohibition.* Except as provided in paragraph (b)(6)(ii) of this section, the owner(s) or operator(s) shall not operate the lead smelter sinter machine or any zinc plant roaster when any acid plant(s) serving that process is shut down for maintenance.

(ii) *Criteria for Continuing Process Operation.* Excess emissions occurring during the period when the acid plant is shutdown for the annual maintenance period¹² shall not constitute a violation of paragraph (b)(1)(ii) of this section or be included in the computation of the plant wide SO₂ emissions of paragraph (b)(1)(i)(B) of this section, provided that:

(A) The owner(s) or operator(s) commits to install additional SO₂ removal facilities and/or performs process changes to capture a gas stream in accordance with the full scale research and development program requirements of paragraphs (b)(5)(i) and (b)(5)(vii) of this section. If at any time the owner(s) or operator(s) elect not to undertake a full scale qualifying project, excess emissions occurring during the period when the acid plant is shut down for any annual maintenance period shall constitute a violation of this regulation;

(B) the owner(s) or operator(s) provide written notification to the EPA—Region X on or before June 11, 1980, that it will perform the full scale research and development program. During the period prior to such notification, excess emissions occurring when the acid plant is shut down for the annual maintenance period shall not constitute a violation of this regulation. Such continued operation while an acid plant is shutdown for annual maintenance shall not in any event exceed fourteen (14) calendar days per year for each acid plant through and until June 11, 1980.

(C) Commencing with the first twelve (12) month period after the election of a full scale qualifying research and development system under paragraph

(b)(5)(i) of this section, and until the system is required to be placed in service under paragraph (b)(5)(vii) of this section, the combined amount of SO₂ which is released by reason of continued process operation during the annual acid plant maintenance period for all 3 acid plants does not exceed the lesser of fourteen (14) days for each acid plant per year or the annual incremental SO₂ capture for which the full scale research and development system is designed.

(D) During the period of time commencing when the full scale research and development system is required to first be placed in service under paragraph (b)(5)(vii) of this section and ending on the expiration date of the first primary non-ferrous smelter order, the following shall apply:

(1) No process operation is allowed to continue while the respective acid plant is shut down for its annual maintenance period until and unless the full scale system or process change has operated for the time period specified in paragraph (b)(6)(iii) of this section;

(2) During such time period, the full scale system or process change must perform substantially in accord with the system design criteria set forth in paragraph (b)(5)(ii) of this section;

(3) The owner(s) or operator(s) must continue to operate the full scale research and development system beyond the time period described in paragraph (b)(6)(iii) of this section and until the expiration date of the first primary non-ferrous smelter order; further the system must perform substantially in accord with the system design criteria set forth in paragraph (b)(5)(ii) of this section; and

(4) The combined annual amount of SO₂ which is released by reason of continued process operation during the annual acid plant maintenance period shall not exceed for all 3 acid plants the annual incremental SO₂ capture for which the full scale research and development system is designed and operated;

(E) Annual maintenance shall not be performed simultaneously on the lead smelter acid plant and any zinc acid plant or simultaneously on both zinc plant and acid plants. If, under paragraph (b)(5)(i) of this section, a sinter machine flue gas desulfurization system is installed, annual maintenance shall not be performed simultaneously on the lead smelter acid plant and the flue gas desulfurization system; further, the sinter machine flue gas desulfurization system shall receive the maximum quantity of SO₂ practicable from the sinter machine when the lead smelter acid plant is shutdown. During

¹² The term "annual maintenance period" as used herein is defined as the period occurring once (or twice if the catalyst needs to be replaced two times a year) per year for each acid plant when various maintenance functions such as catalyst replacement and heat exchanger cleaning occur. This period normally lasts less than two weeks.

annual acid plant maintenance at the zinc plant, the zinc plant acid plant which remains in service shall receive the maximum quantity of SO₂ practicable from the operating zinc roasters; and

(F) Continued process operation while an acid plant is shutdown for annual maintenance shall not in any event exceed fourteen (14) calendar days for each acid plant per year.

(iii) *Discontinuance of Full Scale Research and Development Program.* In the event that severe and unavoidable production losses are incurred as a direct result of the operation of the full scale research and development system or process change during a full nine (9) month period for the flue gas desulfurization system or three (3) month period for the sinter machine weak stream recirculation, or upon terms otherwise agreed, in writing, by the Administrator, the owner(s) or operator(s) may discontinue operation of the full scale research and development project provided that:

(A) Notification to the Administrator of discontinuance of such operation shall be given within one month following the expiration of the requisite period. Such notification shall be accompanied by a full written justification of and analysis for the discontinuance; and 111(B) Until the expiration date of the first primary non-ferrous smelter order, the lead smelter sinter machine and any zinc plant roaster shall be shut down during any subsequent annual acid plant maintenance period.

(iv) *Pre-determined SO₂ Emissions.* For the purposes of determining compliance with the design and operating criteria set forth in paragraphs (b)(6)(ii)(C) and (D) of this section, the quantity of incremental SO₂ deemed captured by the full scale qualifying project shall be calculated using a predetermined quantity of SO₂ which is emitted in the relevant gas stream prior to installation of such full scale project. The determination of pre-existing SO₂ emissions shall be as follows:

(A) For the sinter machine weak stream, a value of 15.7 tons of SO₂ per 24 hours of operation shall be used;

(B) For the blast furnace, a value of 18.3 tons of SO₂ per 24 hours of operation shall be used; and

(C) On or before June 11, 1980, if the owner(s) or operator(s) demonstrate to the satisfaction of the Administrator, using manual source test techniques, continuous SO₂ measurement techniques, or equivalent alternatives, that a different pre-existing SO₂ emission value is correct, that value may be substituted for the value(s)

listed in paragraphs (b)(6)(iv)(A) and (B) of this section upon agreement of the Administrator.

(7) *Violations*—(i) *Violations of Provisions.* Failure to comply with any provisions of this regulation or with the NSO issued to replace this regulation may subject the owner(s) or operator(s) to enforcement and sanctions as set forth in the Clean Air Act and regulations promulgated thereunder.

(ii) *Violations of NAAQS.* Nothing in this subparagraph shall be construed to relieve the owner(s) or operator(s) from liability for violations of the NAAQS.

Appendix A—Fugitive Sulfur Dioxide Emission Control Program and its Impact to Total Plant Emissions

The total plant emission limitation of paragraph (b)(1)(i)(B) was developed based on historical emission data and included the increase in SO₂ emissions from the main stacks that would likely occur as a result of implementation of the fugitive control program described in paragraphs (b)(1)(vi)(C) (zinc roaster), (b)(1)(vi)(D) (sinter machine), and (b)(1)(vi)(E) (blast furnace). Accordingly, failure of the owner(s) or operator(s) to comply with any of the provisions of the fugitive SO₂ control program will be deemed a violation of this regulation.

Amount of plant wide
emission reduction
from the 625 tons
per 7-day limit

= 21 x

$$\left[1 - \frac{33.6 - 2(H_u - 3.36)}{33.6} \right]$$

Where H_u =

hours in any 7-day period when the blast furnace is in an upset condition. For the purpose of use in this formula H_u cannot exceed 20.16 hours.

For example, if blast furnace upset conditions occur for 8.36 hours in any 7-day period the plant wide emission limit would be reduced 6 tons per running 7-day period, i.e. the new plant wide emission limit would be 619 tons SO₂ per running 7-days.

[FR Doc. 79-38235 Filed 12-12-79; 8:45 am]

BILLING CODE 6560-01-M

DEPARTMENT OF TRANSPORTATION

Coast Guard

46 CFR Part 187

[CGD 79-063]

Re-Examination and Refusal of Licenses

AGENCY: Coast Guard, DOT.

ACTION: Final Rule.

Compliance will be determined as follows:

a. The zinc roaster program of paragraph (b)(1)(vi)(C) is based on compliance with applicable OSHA lead workplace standards in accordance with the OSHA schedules of compliance;

b. The sinter machine program of paragraph (b)(1)(vi)(D) must ensure complete installation of new stainless steel hooding with the exception of the last two (2) sections of the hood which are not subject to high corrosion on or before June 11, 1980; and

c. The blast furnace program of paragraph (b)(1)(vi)(E) must eliminate 90 percent of the blast furnace upset conditions (currently occurring approximately 20 percent of the time).

EPA inspection of the blast furnace operation will be made to ensure that upset conditions occur no more than an aggregate total of 3.36 hours per any 7-day period. The owner(s) or operator(s) explicitly agree that failure to meet the requirements stated herein at any time subsequent to June 11, 1980, will immediately result in the decrease in the plant wide emission limit in proportion to the amount the objective was not attained. The proportional formula is shown below:

SUMMARY: This action amends Coast Guard regulations governing the re-examination of applicants for licenses to operate vessels of less than 100 gross tons engaged in carrying more than six passengers. As previously written, these regulations required applicants who failed their first examination to wait a period of one month before being re-examined. This amendment reduces the waiting period to ten days, thereby lessening the economic consequences to persons who are dependent upon the operation of small passenger vessels for their livelihood. It will give permanent effect to a procedure that did not

adversely affect safety interests when implemented on a trial basis during the past year.

EFFECTIVE DATE: This amendment is effective on January 14, 1980.

FOR FURTHER INFORMATION CONTACT:

Lieutenant Commander Leo G. Vaske, Merchant Vessel Personnel Division, Office of Merchant Marine Safety, Room 1400, Coast Guard Headquarters, Washington, D.C. 20593 (202) 426-2251.

SUPPLEMENTARY INFORMATION: A notice of proposed rulemaking concerning this amendment was published in the *Federal Register* on July 19, 1979 (44 FR 42274). Interested persons were invited to submit comments on the proposal by September 19, 1979. Only one comment was received, and this favored the proposal's adoption.

This amendment has been reviewed and determined to be non-significant under the Department of Transportation's "Regulatory Policies and Procedures" published on February 26, 1979 (44 FR 11034). A final evaluation has been prepared and included in the public docket. This may be obtained from the Marine Safety Council (G-CMC/TP24), Coast Guard Headquarters, Washington, D.C. 20593 (202) 755-4901.

The principal persons involved in drafting this rule are: Lieutenant Commander Leo G. Vaske, Project Manager, Office of Merchant Marine Safety, and Coleman Sachs, Project Attorney, Office of the Chief Counsel.

In consideration of the foregoing, Part 187 of Title 46, Code of Federal Regulations is amended by revising paragraph (a) of § 187.05-15 to read as follows

§ 187.05-15 Re-examination and refusal of licenses.

(a) Any applicant for license or endorsement who has been duly examined or re-examined and refused may come before the same Officer in Charge, Marine Inspection, for re-examination at any time thereafter that may be fixed by such Officer in Charge, Marine Inspection, but such time shall not be less than ten days from the date of the applicant's last failure.

(46 U.S.C. 390b, 49 U.S.C. 1655(b), 49 CFR 1.46(b))

Dated: December 6, 1979.

J. B. Hayes,

Admiral, U.S. Coast Guard, Commandant.

[FR Doc. 79-38282 Filed 12-12-79; 8:45 am]

BILLING CODE 4910-14-M

Research and Special Programs Administration

49 CFR Parts 172 and 174

[Docket No. HM-161; Amdt. Nos. 171-51, 172-56, 173-134, 174-36, 175-10, 176-10, 177-47, 178-60]

Detonators and Detonating Primers

Correction

In FR Doc. 79-37612, appearing in the issue of Monday, December 10, 1979, at page 70721, correct the tables beginning on page 70723 to 70729 and inclusive by noting that the underscored material should be italicized and on page 70732, in the first column, the correction designated as No. 12 under § 174.101 Loading explosives, paragraph (h), the first line, add an "s" to the word "package".

BILLING CODE 1505-01-M

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 74-9; Notice 6]

Child Restraint Systems Seat Belt Assemblies and Anchorages

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

ACTION: Final rule.

SUMMARY: This rule establishes a new Standard No. 213, *Child Restraint Systems*, which applies to all types of child restraints used in motor vehicles. It also upgrades existing child restraint performance requirements by setting new performance criteria and by replacing the current static tests with dynamic sled tests that simulate vehicle crashes and use anthropomorphic child test dummies. The new standard would reduce the number of children under 5 years of age killed or injured in motor vehicle accidents.

DATES: On June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, *Child Seating Systems*, or the new Standard No. 213, *Child Restraint Systems*.

ADDRESSES: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration,

400 Seventh Street, SW., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264).

SUPPLEMENTARY INFORMATION: This notice establishes a new Standard No. 213, *Child Restraint Systems*. A notice of proposed rulemaking was published on May 18, 1978 (43 FR 21470) proposing to upgrade and extend the applicability of the existing Standard No. 213, *Child Seating Systems*. The existing standard does not regulate car beds and infant carriers and uses static testing to assess the effectiveness of child restraint systems. The new standard covers all types of child restraint systems and evaluates their performance in dynamic sled tests with anthropomorphic test dummies. On May 18, 1978 NHTSA also published a companion notice of proposed rulemaking proposing to amend Part 572, *Anthropomorphic Test Dummies*, by specifying requirements for two anthropomorphic test dummies representing 3 year and 6 month old children (43 FR 21490) for use in compliance testing under proposed Standard No. 213. The comment closing date for both notices was December 1, 1978.

At the request of the Juvenile Product Manufacturers Association, NHTSA extended the comment closing date until January 5, 1979, for the portions of both proposals dealing with testing with the child test dummies. This extension was granted because manufacturers were reportedly having problems obtaining the proposed test dummies to conduct their own evaluations.

Consumers, public health organizations, child restraint manufacturers and others submitted comments on the proposed standard. The final rule is based on a thorough evaluation of all data obtained in NHTSA testing, data submitted in the comments, and data obtained from other pertinent documents and test reports. Significant comments submitted to the docket are addressed below. The agency will soon issue a final rule on the anthropomorphic test dummy proposal.

Summary of the Final Rule Provisions

The significant portions of the new standard are as follows:

1. The performance of the child restraint system is evaluated in dynamic tests under conditions simulating a frontal crash of an average automobile at 30 mph. The restraint system is anchored with a lap belt and, if

provided with the restraint, a supplementary anchorage belt (tether strap). An additional frontal impact test at 20 mph is conducted for restraints equipped with tether straps or arm rests. In that additional test, child restraints with tether straps will be tested with the tether straps detached and child restraints with arm rests will be tested with the arm rest in place but with the child restraint system belts unbuckled. The additional 20 mph tests are intended to ensure a minimum level of safety performance when the restraints are improperly used.

2. To protect the child, limitations are set on the amount of force exerted on the head and chest of the child test dummy during the dynamic testing of restraints specified for children over 20 pounds. Limitations are also set on the amount of frontal head and knee excursions experienced by the test dummy in forward-facing child restraints and harnesses. To prevent a child from being ejected from a rearward-facing restraint, limitations are set on the amount the seat can tip forward and on the amount of excursion experienced by the test dummy during the simulated crash.

3. During the dynamic testing, no load-bearing or other structural part of any child restraint system shall separate so as to create jagged edges that could injure a child. If the restraint has adjustable positions, it must remain in its pre-test adjusted position during the testing so that the restraint does not shift positions in a crash and possibly injure a child's limbs caught between the shifting parts or allow a child to submarine during the crash (i.e., allow the child's body to slide too far forward and downward, legs first).

4. To prevent injuries to children during crashes from contact with the surface of the restraint, requirements for the size and shape are specified for those surfaces. In addition, protective padding requirements are set for restraints used by children weighing 20 pounds or less.

5. Requirements in Standards No. 209, *Seat Belt Assemblies* (49 CFR 571.209), are applied to the belt restraints used in child restraint systems.

6. The amount of force necessary to open belt buckles and release a child from a restraint system is specified so that children cannot unbuckle themselves, but adults can easily open the buckle.

7. To promote the easy and correct use of all child restraint systems, they are required to attach to the vehicle by means of vehicle seat belts.

8. Warnings for proper use of the restraints must be permanently posted

on the restraint so that the warnings are visible when the restraint is installed. Other information, such as the height and weight limits for children using the child restraint, must also be permanently displayed on the restraint but it does not have to be visible when the restraint is installed. The restraint must also have a location for storing an accompanying information booklet or sheet on how to correctly install and use the restraint.

9. A standard seat assembly is used in the dynamic testing to represent the typical vehicle bench seat and thereby avoid the cost of testing child restraints on numerous vehicle seats.

Applicability of Standard No. 213

The provisions of new Standard No. 213 apply to all types of child restraints used in motor vehicles for protection of children weighing up to 50 pounds, such as child seats, infant carriers, child harnesses and car beds. Beginning on June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, *Child Seating Systems*, or of the new Standard No. 213, *Child Restraint Systems*.

Dynamic Testing

The requirements to be met in the dynamic testing of child restraints include: maintaining the structural integrity of the system, retaining the head and knees of the dummy within specified excursion limits (i.e., limits on how far those portions of the body may move forward) and limiting the forces exerted on the dummy by the restraint system. These requirements will reduce the likelihood that the child using a child restraint system will be injured by the collapse or disintegration of the system, or by contact with interior of the vehicle, or by imposition of intolerable forces by the restraint system. As explained below, omission of any of these three requirements would render incomplete the criteria for the quantitative assessment of the safety of a child restraint system and could very well lead to the design and use of unsafe restraints.

It was suggested in comments by the child restraint manufacturers and their trade association, the Juvenile Products Manufacturers Association (JPMA), that available restraints are performing satisfactorily. According to them, the new standard imposes expensive testing requirements with instrumented dummies which will increase the price

of child restraints and discourage the purchasing of child restraints because of their increased costs. Many manufacturers suggested that the agency limit the standard to tests for occupant excursion and restraint system structural integrity in dynamic tests and not require the use of instrumented test dummies to measure crash forces imposed upon a child.

NHTSA recognizes that some child restraints perform relatively well, but the agency's testing has shown that others perform unsatisfactorily. Measuring only the structural integrity of the system and the amount of occupant excursion allowed during the testing does not provide a measurement of the severity of forces imposed on a child during a crash and thus does not provide an accurate assessment of the actual safety of the system. For example, a manufacturer could design a restraint with a surface mounted in front of the child that would allow a small amount of occupant excursion. However, that surface could impose potentially injurious forces on a child. NHTSA believes that the force measurement performance requirements are a crucial and necessary test to adequately judge a restraint system's effectiveness in preventing or reducing injuries. The use of instrumented test dummies and force measurement requirements are crucial elements of Standard No. 208, *Occupant Crash Protection*, which establish performance requirements for automatic restraint systems. NHTSA believes that systems designed specifically for children should have to provide the same high degree of occupant protection.

Several manufacturers (GM, Ford, Questor, and others) and JPMA objected to the proposed head and chest acceleration limits that must not be exceeded in the dynamic testing. They argued that the acceleration limits are based on biomechanical data for adults and there is no data showing their applicability to children. Because of the lack of biomechanical data on children's tolerance to impact forces, NHTSA has conducted tests of child restraints with live primates to serve as surrogates for three-year-old children. Primates are similar in certain respects to children and, have been used by GM, Ford and others as surrogates in child restraint testing to assess potential injuries to children in crashes. In simulated 30 mph crashes conducted for NHTSA, similar to the test prescribed in the proposed standard, the primates either were not injured or sustained only minor injuries. NHTSA has also conducted child restraint tests using instrumented test

dummies representing three-year-old children instead of primates. In the tests, the forces measured on the test dummies, which had not been injurious to the primates, did not exceed the head and chest acceleration criteria proposed in the standard. NHTSA is thus confident that the child restraints which do not exceed these performance criteria in the prescribed tests should prevent or reduce injuries to children in crashes.

Use of instrumented test dummies should not unduly raise the price of child restraints. Since many child restraint systems are already close to compliance, the cost per restraint of any needed design and testing costs should be minimal.

The May 1978 notice would have required restraint systems with adjustable positions to meet the performance requirements of the standards in any of its adjusted positions recommended for use in a motor vehicle. The restraint would have had to remain in its adjusted position during testing. International Manufacturing Co. requested the agency to test adjustable restraints in only their extreme up and down positions. If a manufacturer chooses to offer a seat with a number of adjustable positions which it recommends for use in a motor vehicle, it is important that the seat meet the performance requirements of the standard at any of those positions. Therefore, International's request is denied. NHTSA urges manufacturers not to include any adjustment positions for their restraints which are not to be used in a motor vehicle.

Strollee, Questor and Volvo asked NHTSA to allow adjustable position restraints to change positions during the testing, arguing that controlled change of position can be an effective energy-absorbing method. Allowing changes from one adjustment position to another during a crash can cause injuries to children's hands or fingers caught between the structural elements of the restraint as it changes position. Other effective energy-absorbing methods are available which will not pose a risk of injury to children. Thus, NHTSA is not adopting this suggestion.

Child restraint manufacturers and other interested parties, such as Action for Child Transportation Safety (ACTS), American Academy of Pediatrics, Physicians for Automotive Safety and Michigan's Office of Highway Safety, urged NHTSA to lengthen the 30 inch head and knee excursion requirements for forward-facing restraints. They argued that some child restraint systems which have been effective in real world crashes will exceed the proposed head

excursion limit. NHTSA has reviewed its child restraint tests and determined that during the last few inches of excursion the remaining velocity of the head in impacts with padded surfaces is relatively low. Because slightly increasing the head excursion should not increase the forces imposed upon the child's head, the head excursion limit is changed from 30 to 32 inches.

The May 1978 notice proposed limiting the amount of knee excursion in forward-facing child restraints to 30 inches. The purpose of the knee excursion limit is to prevent manufacturers from controlling the amount of head excursion by designing their restraints so that their occupants submarine excessively during a crash (i.e., so that their bodies slide too far downward and forward, legs first). Many child restraint manufacturers and JPMA asked the agency to lengthen the knee excursion limits. They argued that many restraints, particularly reclining child restraints where the occupant's knees will be further forward than a non-reclining child restraint, cannot pass the knee excursion limit, but do not allow the occupants to submarine. They claimed that the reclining feature is a comfort and convenience device which promotes seat usage since it allows a child to sleep in the restraint. They recommended that the agency establish a separate requirement which would prevent the occupant's torso from straightening out and submarining under the belts. NHTSA has tested several child restraints in the reclining position and determined that the knee excursion can be lengthened to 36 inches without allowing submarining if the dummy's torso has rotated at least 15 degrees forward from its initial starting position when the knees have reached their maximum excursion. Thus, the new standard incorporates a 36 inch knee excursion limit and requires the test dummy's torso to have rotated at least 15 degrees forward when the knees have reached their maximum excursion.

For rear-facing child restraints (i.e., infant carriers) the May 1978 notice proposed retaining the dummy's head within the confines of the seat and preventing the back support surface of the restraint from tipping forward far enough to allow the angle between it and the vertical to exceed 60 degrees. If the support surface were allowed to tip more, the infant in the restraint could slide head first out of the shoulder straps. GM and Heinrich Von Wimmersperg pointed out that there is a conflict between the description of the confines of rear-facing restraints contained in the text of the standard

and the manner in which the confines are defined in one of the figures incorporated in the standard. The text has been modified to correctly identify the confines of the restraint systems. GM also commented that the text of the standard defined the head confinement requirements in reference to the head target points of the infant dummy, although the infant dummy, unlike the 3 year child test dummy, does not have target points. The revised specifications for the infant test dummy do include head target points and therefore the confinement requirement is retained as originally proposed.

Several child restraint manufacturers objected to limiting the forward tipping of rear-facing restraints to 60 degrees. They argued that rear-facing child restraints can tip as much as 70 degrees forward and still retain the child within the restraint. They also argued that a rear-facing restraint will hit the instrument panel in the front seat, or the back of the front seat if the restraint is used in the rear seat, before the restraint tips 60 degrees. NHTSA is retaining a limit on forward tipping since a child restraint can be used in a vehicle with the vehicle's front seat moved to its extreme forward or rearward position. If the child restraint is used in the front seat and the vehicle seat is in the extreme rearward position, the child restraint can tip forward without striking the instrument panel. Likewise, a child restraint used in the rear seat, where the vehicle's front seat is in its extreme forward position, can tip forward without striking the back of the front seat. However, tests done by NHTSA have shown that a restraint can tip forward as much as 70 degrees while still retaining the child within the confines of the restraint. Therefore, the limitation on forward tipping is being changed to 70 rather than 60 degrees.

One child restraint manufacturer, the American Association for Automotive Medicine and Heinrich Von Wimmersperg commented that manufacturers of rear-facing restraints may attempt to comply with the limitation on forward rotation by designing the normal resting angle of the seat in a very vertical alignment or by adding attachments to prop the seat into a vertical position. Either of those approaches can create an uncomfortable seating position for the child. They recommended that the agency establish a minimum resting angle for rear-facing restraints. The agency is not adopting this suggestion at this time. By increasing the amount of forward rotation allowed, the agency should have removed the temptation for

manufacturers to design restraint resting angles which would make it easier to comply with the requirement, but would create uncomfortable seating positions for the child.

The May 1978 notice proposed an additional dynamic test at 20 mph for child restraint systems equipped with tether straps with those straps left unattached. A number of commenters (such as Insurance Institute for Highway Safety, ACTS, University of Tennessee, Questor, Bobby Mac, and Michigan's Office of Highway Safety) commented that many people fail to connect the tether. They recommended that this type of restraint be tested at 30 mph with unattached tethers.

The agency is aware of the benefits and disadvantages of child restraints equipped with tethers, which presently account for over 70 percent of the child restraint sales. The agency's testing has shown that in 30 mph frontal tests child restraints with the tethers attached have less occupant excursion and lower head and chest accelerations than shield-type restraints that do not use tethers. Tethered restraints also allow far less occupant excursion in lateral crashes than shield-type restraints. The available accident data on child restraints, which includes consumer letters and accident investigation reports, is limited since the usage of child restraints is low. It does show, however, that tethered restraints, both properly tethered and untethered, have prevented injuries to children in crashes where other vehicle occupants were severely injured.

Because of the performance of properly tethered child restraints under testing and accident conditions, the agency does not want to eliminate those restraints from the market. At the same time, the agency wants to reduce or eliminate the possibility of people not using the tethers that accompany those restraints. Therefore, the agency is requiring all seats equipped with a tether to have a visible label warning people to correctly fasten the tether. In addition, the agency is considering issuing a proposal to require vehicle manufacturers to provide attachments for tether anchorages in all their vehicles. Having such attachments will enable parents to easily and properly attach tethers. The agency is also striving to promote the increased and proper use of child restraints through educational programs. As a part of this effort, NHTSA has conducted a series of regional seminars aimed at helping grass roots organizations educate parents about the importance of child restraints. An NHTSA-sponsored national

conference on child restraint safety is scheduled for December 10-12 in Washington, D.C. to further these educational programs.

To ensure that restraints equipped with tethers provide at least a minimum level of protection if they are misused, the agency will require an additional dynamic test at 20 mph for those restraints. When tested with tethers unattached, the restraints must pass all the dynamic test performance requirements of the standard.

Energy Absorption and Distribution

Several manufacturers (Questor, Strollee, Cosco) and JPMA objected to the proposed height requirements for head restraints used to control the rearward movement of a child's head in a crash. The proposal would have slightly increased the requirements currently set in Standard No. 213. They argued that there was no basis for the change, which would require them to redesign their child restraints. The new requirements are based on anthropometric data on children gathered since the standard was originally adopted. NHTSA proposed the new head restraint height requirements in its earlier March 1974 notice of proposed rulemaking on child restraints and many manufacturers have already redesigned their seats to comply with the requirements. Since the new heights more accurately reflect the seating heights of children than the old requirements, the agency is adopting them as proposed. The notice proposed that the top of the head restraint be 22 inches above the seating surface for restraints used by children weighing more than 40 pounds. Questor requested the upper weight be changed to 43 pounds. Since 40 pounds represents the weight of a 50th percentile 5 year old and 23 inches represents its seating height, the requirement is not changed.

Several manufacturers (Cosco, Strollee, Questor) and JPMA raised objections to the proposed requirement that head restraints of child restraint systems have a width of not less than 8 inches. They pointed out that the minimum head restraint width requirement is intended to prevent a child's head from going beyond the width of a head restraint in a lateral or rear impact. They argued that restraints with side supports or "wings" should not have to meet the 8 inch width requirement since the side supports will prevent an occupant's head from moving laterally outside the restraint system. NHTSA agrees that the side supports should help laterally retain the child's head within the restraint during a side or rear impact and therefore is

exempting those restraints from the 8 inch minimum width requirement. However, to ensure that child restraints with side supports have sufficient width to accommodate the heads of the largest child using the restraint, the agency has set a 6 inch minimum width for those restraints. In addition, to ensure that side supports are large enough to retain an occupant's head within the restraint, the agency has set a minimum depth requirement of four inches for those supports. Anthropomorphic data shows that the head of a 50th percentile 5 year old child measures 7 inches front to rear and is 6 inches in breadth. Therefore, a four inch support should contact a sufficient area of the child's head to restrain it.

Manufacturers also questioned if the 8 inch width requirement is to be measured in restraints with side support from the surface of the padded side support or from the surface of the underlying structure before the padding is added. The wording of the standard is changed to make clear that the distance is measured from the surface of the padding, since the padded surface must be wide enough to accommodate the child's head.

The notice proposed that the minimum head restraint height requirement would not apply to restraints that use the vehicle's seat back to restrain the head, if the target point on the side of the head of the test dummy representing a 3 year old child is raised above the top of the seat back. Ford said that because of permitted differences in the dimensions of different test dummies and test seats, its child restraint will not consistently meet the requirements. Ford asked that the height requirement be changed or the manufacturers be permitted to restrict their restraints to seats with head restraints or to rear seats which have a flat surface immediately behind the seat. The standard allows a manufacturer to specify in its instruction manual accompanying the restraints which seating locations cannot be used with the child restraint. Therefore, no change is necessary, since Ford is allowed to restrict use of its restraint.

Several manufacturers (Cosco, Strollee, Questor) and JPMA objected to the proposed force distribution requirement set for the sides of child restraint systems. The specifications do not require manufacturers to incorporate side supports in their restraints, they only regulate the surfaces that the manufacturer decides to provide so that they distribute crash forces over the child's torso. The commenters requested that the agency define the term "torso" and explain the reason for setting

different side support requirements for systems used by infants weighing less than 20 pounds than for systems used by children weighing 20 pounds or more. In restraints for infants less than 20 pounds, the minimum side surface area requirements are based on anthropometric data for a 6-month-old 50 percentile infant to ensure maximum lateral body contact in a side impact. Since the skeletal structure of an infant is just beginning to develop, it is important to distribute impact forces over as large a surface area of the child as possible, rather than concentrating the potentially injurious forces over a small area. For restraints used by children weighing more than 20 pounds and, therefore, having a more developed skeletal structure the minimum surface area requirement is based on anthropometric data for a 50th percentile 3-year-old child to provide restraint for the shoulder and hip areas of the child.

To enable manufacturers to determine their compliance with the torso support requirement, the standard follows the dictionary definition of "torso" and defines the term as referring to the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the seating surface and the top of the shoulders of the test dummy.

Several manufacturers (Cosco, Strollee, Questor) and JPMA questioned the basis for prohibiting surfaces with a radius of curvature of less than 3 inches. They and Hamill also asked if the measurement of the curvature is to be made before or after application of foam padding on the underlying surface. The radius of curvature limitation will prevent sharp surfaces that might concentrate potentially injurious forces on the child. It is based on the performance of systems with such a radius of curvature that have not produced injuries in real world crashes. The standard is changed to require the measurement of the radius of curvature to be made on the underlying structure of the restraint, before application of foam padding. Since foam compresses when impacted in a crash, it is important that the structure under the foam be sufficiently curved so it does not concentrate the crash forces on a limited area of the child's body.

For child restraints used by children weighing less than 20 pounds, the notice proposed that surfaces which can be contacted by the test dummy's head during dynamic testing must be padded with a material that meets certain thickness and static compression requirements. A number of

manufacturers (Strollee, Cosco, GM and Questor) and JPMA questioned the specifications set for the padding, arguing that there is no need to change from the current materials and the specification of a minimum thickness is design restrictive. Other commenters (Bobby-Mac, Hamill and American Association for Automotive medicine) requested that the agency establish a test to measure the energy-absorbing capabilities of the underlying structure of the restraint, as well as of the padding.

NHTSA eventually wants to establish dynamic test requirements using instrumented test dummies for restraints used by children weighing 20 pounds or less. Such testing would measure the total energy absorption capability of the padding and underlying structure. At present, there are no instrumented infant test dummies, so the agency is instead specifying long-established static tests of the padding material.

In response to manufacturer comments, the NHTSA has reevaluated the materials currently used in child restraints and determined that those and other widely available materials can apparently provide sufficient energy absorption if used with a specified thickness. The agency has changed the proposed compression-deflection requirements to allow the use of a wider range of materials which should enable manufacturers to provide protective padding for children without having to increase the price of the restraint.

The proposed ban on components, such as arm rests, directly in front of a child which do not restrain the child was objected to by JPMA, and some manufacturers (Strollee, Century Products, International Manufacturing). They argued that arm restraints should not be banned since they promote usage of a child restraint by giving the child an area to rest against or place a book or other plaything. Other manufacturers (Hamill, Bobby-Mac), Michigan's Office of Highway Safety and the American Academy of Pediatrics supported the ban arguing that arm rests promote misuse by creating the impression that a child can be adequately restrained by merely placing the arm rest in front of the child. The agency is concerned that parents' mistaken beliefs about the protective capability of arm rests may mislead them into not using the harness systems in the restraints.

Therefore, such arm rests or other components only may be installed if they provide adequate protection to a child when the restraint is misused in a foreseeable way because of the presence of the arm rest (i.e., the child is

not buckled into the harness that comes with the child restraint system). To measure the performance of child restraints with arm rests and other devices that flip down in front of the child, those restraints will be tested at 20 mph with the component placed in front of the child, but without the child strapped into the restraint system. The restraint must pass the occupant excursion and other dynamic performance requirements in that condition.

Child Restraint Belt Systems

The May 1978 notice proposed three alternatives for the buckle release force required for the harnesses that restrain a child within the restraint. Many manufacturers favored the alternative based on the current Standard No. 213 which establishes a maximum force of 20 pounds, but does not establish a minimum force. In order to promote international harmonization, Volvo endorsed another alternative proposed by the Economic Commission of Europe which would set a minimum force of 2.25 pounds and a maximum of 13.45 pounds. However, Volvo proposed deviating from the ECE proposal and allowing a maximum release force of 20 pounds. Michigan's Office of Highway Safety and the American Seat Belt Council (ASBC) supported the other alternative which, based on a study by the National Swedish Road and Traffic Institute, would have set a 12 pound minimum force and a 20 pound maximum force. ASBC stated that this alternative should prevent a small child from opening the buckle, but not be too strong to prevent a small adult female from opening the buckle. Other commenters, such as ACTS and Borgess Hospital, recommended that the force be set at a level which children could not manage. Borgess noted that their experience with 400 rental child restraints shows that keeping children from unbuckling their restraints is a common problem. Physicians for Automotive Safety recommended that all buckle types be standardized and the release force be set at a level which can be quickly opened in an emergency.

Based on its review of the comments, NHTSA had decided to require buckles with a minimum release force of 12 pounds and a maximum release force of 20 pounds. The effectiveness of a restraint depends on the child being properly buckled at the time of impact. If a child is capable of releasing the buckle, it can inadvertently or purposely defeat the protection of the harness system. Setting a minimum force of 12 pounds should prevent small children from opening the buckle. Setting a

maximum of 20 pounds as the release force will enable parents to easily open the buckle. NHTSA encourages manufacturers of child restraints to use push button buckles, similar to those used in automobile belts, so that people unfamiliar with child restraints can readily unbuckle them in emergencies. The agency will consider further rulemaking to standardize the buckle if manufacturers do not voluntarily adopt this approach.

Likewise, NHTSA has already advised child restraint manufacturers that physicians have informed the agency that some children are burned during the summer by over-heated metal buckles or other metal child restraint hardware. NHTSA will monitor manufacturer efforts to eliminate this problem and determine if additional rulemaking is necessary.

The proposal that the belt systems in child restraints meet many of the belt and buckle requirements of Standard No. 209, *Seat Belt Assemblies*, such as those relating to abrasion, resistance to light, resistance to microorganisms, color fastness and corrosion and temperature resistance was not opposed by any of the commenters and is therefore adopted. The buckle release test in Standard No. 209 for child restraint buckles is deleted, since Standard 213 now sets new performance requirements for buckles. Ford noted that the proposal inadvertently dropped a portion of Standard No. 209's abrasion requirements, which have been reincorporated in the final rule.

To prevent the belts from concentrating crash forces over a narrow area of a child's body, the proposal sets a minimum belt width of 1½ inch for any belt that contacts the test dummy during the testings. Hamill requested that pieces of webbing used to position the principal belts that maintain crash loads be exempt from the minimum width requirements. The agency believes that as long as the test dummy, and thus a child, can contact the belts during a crash the belts should be wide enough to spread the crash forces and therefore Hamill's request is denied.

Methods of Installation

Many commenters, including ACTS, America Academy for Pediatrics, Insurance Institute for Highway Safety, and American Seat Belt Council, said that child restraint systems cannot be used with some automatic belt systems, since they do not have a lap belt to secure the child restraint to the seat. They asked the agency to require all automatic belt systems to include lap belts.

The agency considers the compatibility of child restraints with automatic belt systems to be an important issue. One of the purposes of the agency's December 12, 1979, public meeting on child safety and motor vehicles is to obtain the public's views and information on that and other child passenger safety issues to assist the agency in determining whether to commence rulemaking. One rulemaking option currently being considered by the agency is to require vehicle manufacturers to provide anchorages for lap belts in automatic restraint equipped vehicles so that parents wishing to install lap belts can easily do so.

A number of manufacturers are voluntarily taking steps to make automatic belt systems compatible with child restraint systems. For example, GM provides an additional manual belt with its optional automatic lap-shoulder belt system for the front passenger's seat in the 1980 model Chevrolet Chevette to enable parents to secure child restraint systems.

Many of the commenters also asked the agency to require vehicle manufacturers to install anchorages or provide predrilled holes to attach tether anchorages in all their vehicles. They argued such anchorages or holes will make it easy for parents to attach tether straps correctly. As mentioned earlier in this notice, the agency is considering issuing a proposal to require manufacturers to provide attachments for tether anchorages in all their vehicles.

The May 1978 notice proposed that all child restraints be capable of being secured to the vehicle seat by a lap belt. Volvo and Mercedes once again asked the agency to allow the use of "vehicle specific" child restraints (systems uniquely designed for installation in a particular make and model which do not utilize vehicle seat belts for anchorages). As explained in the May 1978 notice, such systems can easily be misused by being placed in vehicles for which they were not specifically designed. Standardizing all restraints by requiring them to be capable of being attached by a lap belt is an important way to prevent misuse.

However, since vehicle specific child restraints can provide adequate levels of protection when installed correctly, NHTSA is not prohibiting the manufacture of such devices. The new standard requires them to meet the performance requirements of the standard when secured by a vehicle lap belt. As long as child restraints can pass the performance requirements of the standard secured only by a lap belt, a manufacturer is free to specify other

"vehicle specific" installation conditions.

Labeling

The requirement for having a visible label permanently mounted to the restraint to encourage proper use of child restraints was supported by many of the commenters, including the Center for Auto Safety, ACTS, Insurance Institute for Highway Safety, and Michigan's Office of Highway Safety. Several manufacturers (Century, Cosco, Questor) objected to having a visible label on child restraints, claiming that there is not enough space on some restraints to place all the required information. Other commenters supported the visible labeling requirement but suggested that the visible label only have a single warning telling people to follow the manufacturer's instructions (American Association for Automotive Medicine, Strollee, Hammill). Others suggested placing warnings about the correct use of the restraint on a visible label and placing such information as the height and weight limits for children using the restraint and the manufacturer's certification that it meets all Federal motor vehicle safety standards on a nonvisible label (GM, PAS).

After reviewing the comments, NHTSA concludes that it is important to have certain warnings in a visible position to serve as a constant reminder on how to correctly use the restraint. Because of the limited space on some restraints, the agency has shortened the labeling requirements to require only those instructions most directly concerned with the safe use of the seat be visible. Thus, depending on its design, the restraint must warn parents to secure the restraint with the vehicle lap belt, snugly adjust all belts provided with the restraint, correctly attach the top tether strap and only use a restraint adjustment position which are intended for use in a motor vehicle.

In response to the agency's request for other instructions that a manufacturer should give parents, several commenters (ACTS, Michigan's Office of Highway Safety, Borgess Hospital) said that a warning on the label is necessary to prevent misuse of infant carriers. They said many people mistakenly place infant carriers in a forward-facing, rather than a rear-facing position. A forward-facing position defeats the purpose of those restraints which are designed to spread the forces of the crash over the infant's back. Because of the importance of preventing this type of misuse, the agency will require the visible label to also remind parents not

to use rear-facing infant restraints in any other position.

Information about the height and weight limits of the children for which the restraint is designed, the manufacturer and model of the child restraint, and the month, year and place of manufacture and the certification that the restraint complies with all applicable Federal motor vehicle safety standards would also have to be provided, but that information does not have to be on a label that is visible when the seat is installed.

Many commenters (GM, Insurance Institute for Highway Safety, Multnomah County Department of Human Services, Physicians for Automotive Safety, Center for Auto Safety and American Academy of Pediatrics) supported the proposed requirement that manufacturers inform consumers about the primary consequences of not following the manufacturer's warning about the correct use of the restraint. Therefore, the visible label must state the primary consequence of misusing the restraint. The same information would also have to be included in the instruction manual accompanying the restraint.

Ford objected to the requirement that the label have a diagram showing the child restraint installed in a vehicle as specified in the manufacturer's instructions. It said that because of the complexity of the instructions required for proper installation of a restraint with different types of belt systems, it is not practical to place all of the information on a single label. Hamill suggested that because of those same considerations, the agency should only require the diagram to show the proper installation of the restraint at one seating position. Other commenters, such as the American Academy for Pediatrics, supported the use of diagrams on the restraint noting that diagrams can more easily convey information than written instructions.

To promote the correct use of child restraints, NHTSA believes that it is important to have a diagram on the restraint to remind users of the proper method of installation. However, so that the label does not become too unwieldy, the agency will only require manufacturers to provide a diagram showing the restraint correctly installed in the right front seating position with a continuous loop lap/shoulder belt and in the center rear seating position installed with a lap belt. For restraints equipped with top tethers, the diagram must show the tethers correctly attached in both seating positions. It is important to show the correct use of a child restraint with a continuous loop lap/shoulder belt (a

type of belt system used on many current cars) since such belts must have a locking clip installed on the belt to safely secure the child restraint.

GM objected to the requirement that the label be in block type, which it said makes the label difficult to read. GM requested that manufacturers be allowed to use 10 point type with either capitals or upper and lower case lettering. GM said that using such type will result in an easier to read label which, in turn, should promote more complete reading of the label by the consumer. Since the type sought by GM should promote the reading of the label, the agency is changing the requirement to allow the use of such type as an option.

Several organizations (ACTS, Center for Auto Safety and Insurance Institute for Highway Safety) asked the agency to establish performance test to accompany the requirement that the label be permanently affixed to the restraint. They pointed out that some current paper labels peel off after the restraint has been used awhile. NHTSA has not conducted the necessary testing to establish such a requirement. NHTSA urges manufacturer, whenever possible, to mold the label into the surface of the restraint rather than use a paper label.

Consumers Union and the Center for Auto Safety suggested that all restraints be graded based on their performance in frontal and lateral crash tests and the grades be posted on all the packaging, labels, and instruction manuals accompanying the child restraint. The grades would indicate the seating position within the vehicle with which the restraint can be safely used. Neither Consumers Union nor the Center suggested any performance requirements for establishing the different grades. Since the proposed grading system is outside of the scope of the proposed rule and the agency has not done the necessary testing to determine the specific tests and performance requirements necessary to establish such grading system, NHTSA will evaluate the suggestion for use in future rulemaking.

Installation Instructions

The May 1978 notice proposed that each restraint be accompanied by instructions for correctly installing the restraint in any passenger seat in motor vehicles. Many commenters (Center for Auto Safety, Borgess and Rainbow Hospitals, University of Tennessee and ACTS) suggested that the requirement for the instructions to accompany the restraint should be more explicit to require the restraint to have a storage location, such as a slot in the restraint or

a plastic pouch affixed to the restraint, for permanently storing the instructions. They point out that storing the instructions with the restraint means they will be available for ready reference and will be passed on to subsequent owners of the restraint. NHTSA believes such a requirement would best carry out its intent to require the instructions to be easily available to all users and therefore the suggestion is adopted.

Several manufacturers (Strollee, Cosco) and JPMA objected to the agency's proposed requirement that the instructions state that the center rear seating position is the safest seating position in a vehicle. While not questioning the validity of the accident data showing the center rear seat to be the safest seating position in most vehicles, they argued that the agency should consider the psychological impact of not having the child near the adult. Accident data have consistently shown that the occupants in the rear seat are safer than occupants in the front seat. The same data show that the center rear seating position is the safest seating position in the rear seat. To enable parents to make an informed judgment about how best to protect their children, NHTSA believes that it is important to clearly inform them about the safest seating positions in the vehicle, and is therefore retaining the requirement.

In response to the agency's request for additional suggestions to be included in the instruction manual accompanying the restraint, ACTS suggested that car bed manufacturers inform consumers that the child should be placed with its head near the center of the vehicle. Because orienting a child's head in that way will ensure that it is the maximum distance away from the sides of the vehicle in a side impact, the agency has adopted ACTS suggestion. Tennessee's Office of Urban and Federal Affairs suggested that users should be told to secure child restraints with a vehicle belt when the child restraint is in the vehicle but not in use. Since an unsecured child restraint can become a flying missile in a crash and injure other vehicle occupants, the agency has adopted Tennessee's suggestion.

Test Conditions

The standard specifies requirements for a test assembly representing a vehicle bench seat to be used in the dynamic testing. Bobby-Mac commented that the test seat has a more level seating surface and less support at the forward edge of the seat than the seats in many current cars. These differences mean that a child restraint may

experience more excursion on the test seat than on more angled and firmer car seats, Bobby-Mac said. NHTSA agrees that in comparison to some vehicle seats, the test seat may present more demanding test conditions. However, the test seat is representative of many seats used in vehicles currently on the road. Meeting the performance requirement of the standard on the test seat will ensure that child restraints perform adequately on the variety of different seats found in cars on the road.

Several manufacturers (Cosco and Strollee) and JPMA raised questions about the requirement proposed for the crash pulse (i.e., the amount of test sled deceleration required to simulate the crash forces experienced by a car) for the 20 and 30 mph tests. The agency had proposed a range of sled test pulses to allow manufacturers the option of using pneumatic or impact sled testing machines. Since a variety of different sled test pulses would be permitted under the proposal, manufacturers asked the agency to explain what would happen if they and the agency tested a child restraint system using different sled test pulses and produced inconsistent results (i.e., a failure using one pulse and a pass at the other, when both pulses were within the permissible range). JPMA suggested that the agency should consider a restraint as in compliance if the restraint meets all the applicable performance requirements in a test in which the sled test pulse lies entirely within the proposed range.

To provide manufacturers with certainty they desire, the agency has redefined the sled test pulse requirement to establish a single 20 mph (Figure 3) and a single 30 mph (Figure 2) sled test pulse. Thus, in conducting its compliance testing, NHTSA may not exceed the sled test pulse set for the 20 and 30 mph tests. The sled test pulses chosen by NHTSA are the least severe pulses that meet the acceleration thresholds proposed in the notice of proposed rulemaking. Manufacturers are free to use other sled pulses, as long as the acceleration/time curve of the sled test pulse used is equal to or greater than the acceleration/time curve of the sled test pulse set in the standard.

In response to comments by Ford and others that the durability of the foam used in the standard seat assembly may influence the test results, the agency has changed the standard to specify that the foam in the test seat be changed after each test.

GM pointed out that the instructions for positioning the test dummy within the restraint did not specify when in the positioning sequences any of the restraint's belts should be placed on the

test dummy. An appropriate change has been made to specify when the belts should be attached. Ford said that the dummy positioning requirements result in an "unnatural" positioning of the dummy within its Tot-Guard restraint so that the dummy's arms rest on the side of the restraint rather than with its arms on the padded portion of the shield. NHTSA notes that a child in a real-world accident will not necessarily have its arms resting on the shield. Allowing the test dummy's arm to be positioned on the shield may inhibit the dummy's forward movement and make it easier to comply with the limits on test dummy excursion and acceleration set in the standard. Thus, Ford's requested change in the positioning requirements is rejected.

Flammability

The notice proposed requiring child restraints to meet the burn resistance requirements of Standard No. 302, *Flammability of Interior Materials*. The requirement was supported by GM, the American Academy of Pediatrics and the American Seat Belt Council. No commenters opposed the requirement. In supporting the requirement, GM said that the flammability characteristics of child restraints, "which are in close proximity to an occupant," should be "compatible with the flammability characteristics of other parts of the vehicle occupant compartment interior," which already must meet the performance requirements of Standard No. 302. The agency agrees with GM about the desirability of providing all vehicle occupants with the protection of Standard No. 302 and is thus requiring all child restraints to meet the performance requirements of that standard.

Inertial Reels

Several commenters raised questions about the effectiveness of vehicle seat belts equipped with inertial reels in securing child restraints. The American Academy of Pediatrics requested the agency to restrict the use of inertial reels to the driver's seating position. Physician for Automotive Safety and ACTS pointed out that continuous loop lap/shoulder belts with inertial reels must be used with locking clips to secure a child restraint. They said that the difficulty of installing such clips deters their use.

Agency research has found that use of inertial reels increases the comfort and convenience of seat belts and thus promotes their use by older children and adults. Thus, the agency will continue to require the use of inertial reels in vehicle belt systems. However, to

ensure that inertial reels are compatible with child restraints, the agency will soon begin rulemaking on the comfort and convenience of vehicle belt systems to require that the belts used in the front right outboard seating position have a manual locking device. This requirement will mean that continuous loop and other types of inertial reel belt systems can be easily and effectively used with child restraints. Such manual locking devices will also be permitted with belts used in the rear seats. As previously outlined in this notice, the agency has established several labeling and installation instruction requirements which deal specifically with the correct use of locking clips on continuous loop belts with inertial reels. Those requirements should reduce or eliminate problems associated with using child restraint in current vehicles equipped with inertial reels.

Costs and Benefits

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures implementing that order. The agency's assessment of the benefits and economic consequences of this final rule are contained in a regulatory evaluation which has been placed in the docket. Copies of that regulatory evaluation can be obtained by writing NHTSA's docket section, at the address given in the beginning of this notice.

In the 0 to 5 age group, more than 800 children are killed and more than 100,000 children are injured annually as occupants of motor vehicles. Because of the large difference in effectiveness between restraints that can pass the dynamic test of the new standard and those which have passed only a static test, NHTSA projects that there should be 43 fewer deaths and 6,528 fewer injuries per year. Because many restraints have already been upgraded in response to the agency's prior rulemaking proposal, some of the death and injury prevention benefits of the standard have already been realized.

The projected benefits of this standard are limited by the existing low rate of child restraint use. However, the labeling and instruction requirements of this standard should increase the proper usage of child restraints.

Because of NHTSA's 1974 proposal to upgrade child restraints, many manufacturers have currently designed their restraints to meet dynamic test requirements. Therefore, those restraints are only projected to increase in price by approximately \$1.00 in order to meet

the other requirements of this standard. Restraints that do not currently pass dynamic tests would have a price increase of \$16.00 to meet the new requirements. The average sales weighted price increase is \$4.25.

Numerous commenters (including National Safety Council, American Academy of Pediatricians, Tennessee Office of Child Development and North Dakota's Department of Public Health) urged the agency to make the standard effective before the proposed May 1, 1980, effective date. GM and the American Safety Belt Council requested that the effective date be delayed beyond the proposed May 1, 1980. Many manufacturers have already upgraded their restraints to the performance requirements set in this rule. The agency believes that providing six months leadtime, until June 1, 1980, will provide sufficient time for the remaining manufacturers to upgrade their restraints.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

In consideration of the foregoing, the following amendments are made in Part 571, Chapter V, Title 49, Code of Federal Regulations:

1. Standard No. 209, Seat Belt Assemblies (49 CFR 571.209), is amended to read as follows:

§ 571.209 Standard No. 209; Seat belt assemblies.

S1. Purpose and Scope. This standard specifies requirements for seat belt assemblies.

S2. Application. This standard applies to seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. Definitions. "Seat belt assembly" means any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.

"Pelvic restraint" means a seat belt assembly or portion thereof intended to restrain movement of the pelvis.

"Upper torso restraint" means a portion of a seat belt assembly intended to restrain movement of the chest and shoulder regions.

"Hardware" means any metal or rigid plastic part of a seat belt assembly.

"Buckle" means a quick release connector which fastens a person in a seat belt assembly.

"Attachment hardware" means any or all hardware designed for securing the

webbing of a seat belt assembly to a motor vehicle.

"Adjustment hardware" means any or all hardware designed for adjusting the size of a seat belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

"Retractor" means a device for storing part or all of the webbing in a seat belt assembly.

"Nonlocking retractor" means a retractor from which the webbing is extended to essentially its full length by a small external force, which provides no adjustment for assembly length, and which may or may not be capable of sustaining restraint forces at maximum webbing extension.

"Automatic-locking retractor" means a retractor incorporating adjustment hardware by means of a positive self-locking mechanism which is capable when locked of withstanding restraint forces.

"Emergency-locking retractor" means a retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic action during an emergency and is capable when locked of withstanding restraint forces.

"Seat back retainer" means the portion of some seat belt assemblies designed to restrict forward movement of a seat back.

"Webbing" means a narrow fabric woven with continuous filling yarns and finished selvages.

"Strap" means a narrow nonwoven material used in a seat belt assembly in place of webbing.

"Type 1 seat belt assembly" is a lap belt for pelvic restraint.

"Type 2 seat belt assembly" is a combination of pelvic and upper torso restraints.

"Type 2a shoulder belt" is an upper torso restraint for use only in conjunction with a lap belt as a Type 2 seat belt assembly.

S4 Requirements.

S4.1 (a) Single occupancy. A seat belt assembly shall be designed for use by one, and only one, person at any one time.

(b) Pelvic restraint. A seat belt assembly shall provide pelvic restraint whether or not upper torso restraint is provided, and the pelvic restraint shall be designed to remain on the pelvis under all conditions, including collision or roll-over of the motor vehicle. Pelvic restraint of a Type 2 seat belt assembly that can be used without upper torso restraint shall comply with requirement

for Type 1 seat belt assembly in S4.1 to S4.4.

(c) Upper torso restraint. A Type 2 seat belt assembly shall provide upper torso restraint without shifting the pelvic restraint into the abdominal region. An upper torso restraint shall be designed to minimize vertical forces on the shoulders and spine. Hardware for upper torso restraint shall be so designed and located in the seat belt assembly that the possibility of injury to the occupant is minimized.

A Type 2a shoulder belt shall comply with applicable requirements for a Type 2 seat belt assembly in S4.1 to S4.4, inclusive.

(d) Hardware. All hardware parts which contact under normal usage a person, clothing, or webbing shall be free from burrs and sharp edges.

(e) Release. A Type 1 or Type 2 seat belt assembly shall be provided with a buckle or buckles readily accessible to the occupant to permit his easy and rapid removal from the assembly. Buckle release mechanism shall be designed to minimize the possibility of accidental release. A buckle with release mechanism in the latched position shall have only one opening in which the tongue can be inserted on the end of the buckle designed to receive and latch the tongue.

(f) Attachment hardware. A seat belt assembly shall include all hardware necessary for installation in a motor vehicle in accordance with SAE Recommended Practice J800B, Motor Vehicle Seat Belt Installations, September 1965. However, seat belt assemblies designed for installation in motor vehicles equipped with seat belt assembly anchorages that do not require anchorage nuts, plates, or washers, need not have such hardware, but shall have 7/16-20 UNF-2A or 1/2-13UNC-2A attachment bolts or equivalent hardware. The hardware shall be designed to prevent attachment bolts and other parts from becoming disengaged from the vehicle while in service. Reinforcing plates or washers furnished for universal floor installations shall be of steel, free from burrs and sharp edges on the peripheral edges adjacent to the vehicle, at least 0.06 inch in thickness and at least 4 square inches in projected area. The distance between any edge of the plate and the edge of the bolt hole shall be at least 0.6 inch. Any corner shall be rounded to a radius of not less than 0.25 inch or cut so that no corner angle is less than 135° and no side is less than 0.25 inch in length.

(g) Adjustment. (1) A Type 1 or Type 2 seat belt assembly shall be capable of adjustment to fit occupants whose

dimensions and weight range from those of a 5th-percentile adult female to those of a 95th-percentile adult male. The seat belt assembly shall have either an automatic-locking retractor, an emergency-locking retractor, or an adjusting device that is within the reach of the occupant.

(2) A Type 1 or Type 2 seat belt assembly for use in a vehicle having seats that are adjustable shall conform to the requirements of S4.1(g)(1) regardless of seat position. However, if a seat has a back that is separately adjustable, the requirements of S4.1(g)(1) need be met only with the seat back in the manufacturer's nominal design riding position.

(3) The adult occupants referred to in S4.1(g)(1) shall have the following measurements:

	5th-percentile adult female	95th-percentile adult male
Weight	102 lbs.	215 lbs.
Erect sitting height	30.9 in.	38 in.
Hip breadth (sitting)	12.8 in.	16.4 in.
Hip circumference (sitting)	36.4 in.	47.2 in.
Waist circumference (sitting)	23.6 in.	42.5 in.
Chest depth	7.5 in.	10.5 in.
Chest circumference:		
Nipple	30.5 in.	44.5 in.
Upper	29.8 in.	44.5 in.
Lower	36.6 in.	44.5 in.

(h) *Webbing.* The ends of webbing in a seat belt assembly shall be protected or treated to prevent raveling. The end of webbing in a seat belt assembly having a metal-to-metal buckle that is used by the occupant to adjust the size of the assembly shall not pull out of the adjustment hardware at maximum size adjustment. Provision shall be made for essentially unimpeded movement of webbing routed between a seat back and seat cushion and attached to a retractor located behind the seat.

(i) *Strap.* A strap used in a seat belt assembly to sustain restraint forces shall comply with the requirements for webbing in S4.2, and if the strap is made from a rigid material, it shall comply with applicable requirements in S4.2, S4.3, and S4.4.

(j) *Marking.* Each seat belt assembly shall be permanently and legibly marked or labeled with year of manufacture, model, and name or trademark of manufacturer or distributor, or of importer if manufactured outside the United States. A model shall consist of a single combination of webbing having a specific type of fiber weave and construction, and hardware having a specific design. Webbing of various colors may be included under the same model, but webbing of each color shall comply with the requirements for webbing in S4.2.

(k) *Installation instructions.* A seat belt assembly or retractor shall be accompanied by an instruction sheet providing sufficient information for installing the assembly in a motor vehicle except for a seat belt assembly installed in a motor vehicle by an automobile manufacturer. The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items in SAE Recommended Practice, Motor Vehicle Seat Belt Installations—SAE J800b, published by the Society of Automotive Engineers.

(l) *Usage and maintenance instructions.* A seat belt assembly or retractor shall be accompanied by written instructions for the proper use of the assembly, stressing particularly the importance of wearing the assembly snugly and properly located on the body, and on the maintenance of the assembly and periodic inspection of all components. The instructions shall show the proper manner of threading webbing in the hardware of seat belt assemblies in which the webbing is not permanently fastened. Instructions for a nonlocking retractor shall include a caution that the webbing must be fully extended from the retractor during use of the seat belt assembly unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly. Instructions for Type 2a shoulder belt shall include a warning that the shoulder belt is not to be used without a lap belt.

(m) *Workmanship.* Seat belt assemblies shall have good workmanship in accordance with good commercial practice.

S4.2 Requirements for webbing.

(a) *Width.* The width of the webbing in a seat belt assembly shall be not less than 1.8 inches, except for portions that do not touch a 95th percentile adult male with the seat in any adjustment position and the seat back in the manufacturer's nominal design riding position when measured under the conditions prescribed in S5.1(a).

(b) *Breaking strength.* The webbing in a seat belt assembly shall have not less than the following breaking strength when tested by the procedures specified in S5.1(b): Type 1 seat belt assembly—6,000 pounds or 2,720 kilograms; Type 2 seat belt assembly—5,000 pounds or 2,270 kilograms for webbing pelvic restraint and 4,000 pounds or 1,810 kilograms for webbing in upper torso restraint.

(c) *Elongation.* The webbing in a seat belt assembly shall not extend to more

than the following elongation when subjected to the specified forces in accordance with the procedure specified in S5.1(c): Type 1 seat belt assembly—20 percent at 2,500 pounds or 1,130 kilograms; Type 2 seat belt assembly—30 percent at 2,500 pounds or 1,130 kilograms for webbing in pelvic restraint and 40 percent at 2,500 pounds or 1,130 kilograms for webbing in upper torso restraint.

(d) *Resistance to abrasion.* The webbing of a seat belt assembly, after being subjected to abrasion as specified in S5.1(d), shall have a breaking strength of not less than 75 percent of the breaking strength listed in S4.2(b) for that type of belt assembly.

(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc and shall have a color retention not less than No. 2 on the Geometric Gray Scale published by the American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, N.C.

(f) *Resistance to micro-organisms.* The webbing in a seat belt assembly after being subjected to micro-organisms and tested by the procedures specified in S5.1(f) shall have a breaking strength not less than 85 percent of the strength before subjection to micro-organisms.

(g) *Colorfastness to crocking.* The webbing in a seat belt assembly shall not transfer color to a crock cloth either wet or dry to a greater degree than Class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(g).

(h) *Colorfastness to staining.* The webbing in a seat belt assembly shall not stain to a greater degree than Class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(h).

S4.3 Requirements for hardware.

(a) *Corrosion resistance.* (1) Attachment hardware of a seat belt assembly after being subjected to the conditions specified in S5.2(a) shall be free of ferrous corrosion on significant surfaces except for permissible ferrous corrosion at peripheral edges or edges of holes on underfloor reinforcing plates and washers. Alternatively, such hardware at or near the floor shall be protected against corrosion by at least a Type KS electrodeposited coating of nickel, or copper and nickel, and other attachment hardware shall be protected

by a Type QS electrodeposited coating of nickel or copper and nickel, in accordance with Tentative Specifications for Electrodeposited Coatings of Nickel and Chromium on Steel, ASTM Designation: A166-61T, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103, but such hardware shall not be racked for electroplating in locations subjected to maximum stresses.

(2) Surfaces of buckles, retractors and metallic parts, other than attachment hardware, of a seat belt assembly after subsection to the conditions specified in S5.2(a) shall be free of ferrous or nonferrous corrosion which may be transferred, either directly or by means of the webbing, to the occupant or his clothing when the assembly is worn. After test, buckles shall conform to applicable requirements in paragraphs (d) to (g) of this section.

(b) *Temperature resistance.* Plastic or other nonmetallic hardware parts of a seat belt assembly when subjected to the conditions specified in S5.2(b) shall not warp or otherwise deteriorate to cause the assembly to operate improperly or fail to comply with applicable requirements in this section and S4.4.

(c) *Attachment hardware.* (1) Eye bolts, shoulder bolts, or other bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of 9,000 pounds or 4,080 kilograms when tested by the procedure specified in S5.2(c)(1), except that attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies cannot be attached to the vehicle by a single bolt shall have a breaking strength of not less than 5,000 pounds or 2,270 kilograms.

(2) Other attachment hardware designed to receive the ends of two seat belt assemblies shall withstand a tensile force of at least 6,000 pounds or 2,720 kilograms without fracture of any section when tested by the procedure specified in S5.2(c)(2).

(3) A seat belt assembly having single attachment hooks of the quick-disconnect type for connecting webbing to an eye bolt shall be provided with a retaining latch or keeper which shall not move more than 0.08 inch or 2 millimeters in either the vertical or horizontal direction when tested by the procedure specified in S5.2(c)(3).

(d) *Buckle release.* (1) The buckle of a Type 1 or Type 2 seat belt assembly shall release when a force of not more than 30 pounds or 14 kilograms is applied.

(2) A buckle designed for pushbutton application of buckle release force shall have a minimum area of 0.7 square inch or 4.5 square centimeters with a minimum linear dimension of 0.4 inch or 10 millimeters for applying the release force, or a buckle designed for lever application of buckle release force shall permit the insertion of a cylinder 0.4 inch or 10 millimeters in diameter and 1.5 inches or 38 millimeters in length to at least the midpoint of the cylinder along the cylinder's entire length in the actuation portion of the buckle release. A buckle having other design for release shall have adequate access for two or more fingers to actuate release.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall not release under a compressive force of 400 pounds applied as prescribed in paragraph S5.2(d)(3). The buckle shall be operable and shall meet the applicable requirement of paragraph S4.4 after the compressive force has been removed.

(e) *Adjustment force.* The force required to decrease the size of a seat belt assembly shall not exceed 11 pounds or 5 kilograms when measured by the procedure specified in S5.2(e).

(f) *Tilt-lock adjustment.* The buckle of a seat belt assembly having tilt-lock adjustment shall lock the webbing when tested by the procedure specified in S5.2(f) at an angle of not less than 30 degrees between the base of the buckle and the anchor webbing.

(g) *Buckle latch.* The buckle latch of a seat belt assembly when tested by the procedure specified in S5.2(g) shall not fail, nor gall or wear to an extent that normal latching and unlatching is impaired, and a metal-to-metal buckle shall separate when in any position of partial engagement by a force of not more than 5 pounds or 2.3 kilograms.

(h) *Nonlocking retractor.* The webbing of a seat belt assembly shall extend from a nonlocking retractor within 0.25 inch or 6 millimeters of maximum length when a tension is applied as prescribed in S5.2(h). A nonlocking retractor on upper torso restraint shall be attached to the nonadjustable end of the assembly, the reel of the retractor shall be easily visible to an occupant while wearing the assembly, and the maximum retraction force shall not exceed 1.1 pounds or 0.5 kilogram in any strap or webbing that contacts the shoulder when measured by the procedure specified in S5.2(h), unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* The webbing of a seat belt assembly equipped with an automatic locking retractor, when tested by the procedure

specified in S5.2(i), shall not move more than 1 inch or 25 millimeters between locking positions of the retractor, and shall be retracted with a force under zero acceleration of not less than 0.6 pound or 0.27 kilogram when attached to pelvic restraint, and not less than 0.45 pound or 0.2 kilogram nor more than 1.1 pounds or 0.5 kilogram in any strap or webbing that contacts the shoulders of an occupant when the retractor is attached to upper torso restraint. An automatic locking retractor attached to upper torso restraint shall not increase the restraint on the occupant of the seat belt assembly during use in a vehicle traveling over rough roads as prescribed in S5.2(i).

(j) *Emergency-locking retractor.* An emergency-locking retractor of a Type 1 or Type 2 seat belt assembly, when tested in accordance with the procedures specified in paragraph S5.2(j)—

(1) Shall lock before the webbing extends 1 inch when the retractor is subjected to an acceleration of 0.7g;

(2) Shall not lock, if the retractor is sensitive to webbing withdrawal, before the webbing extends 2 inches when the retractor is subjected to an acceleration of 0.3g or less;

(3) Shall not lock, if the retractor is sensitive to vehicle acceleration, when the retractor is rotated in any direction to any angle of 15° or less from its orientation in the vehicle;

(4) Shall exert a retractive force of at least 0.6 pound under zero acceleration when attached only to the pelvic restraint.

(5) Shall exert a retractive force of not less than 0.2 pound and not more than 1.1 pounds under zero acceleration when attached only to an upper torso restraint;

(6) Shall exert a retractive force of not less than 0.2 pound and not more than 1.5 pounds under zero acceleration when attached to a strap or webbing that restrains both the upper torso and the pelvis.

(k) *Performance of retractor.* A retractor used on a seat belt assembly after subsection to the tests specified in S5.2(k) shall comply with applicable requirements in paragraphs (h) to (j) of this section and S4.4, except that the retraction force shall be not less than 50 percent of its original retraction force.

S4.4 Requirements for assembly performance.

(a) *Type 1 seat belt assembly.* The complete seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedures specified in C5.3(a):

(1) The assembly loop shall withstand a force of not less than 5,000 pounds or 2,270 kilograms; that is, each structural component of the assembly shall withstand a force of not less than 2,500 pounds or 1,130 kilograms.

(2) The assembly loop shall extend not more than 7 inches or 18 centimeters when subjected to a force of 5,000 pounds or 2,270 kilograms; that is, the length of the assembly between anchorages shall not increase more than 14 inches or 36 centimeters.

(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 4,200 pounds or 1,910 kilograms.

(4) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

(b) *Type 2 seat belt assembly.* The components of a Type 2 seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedure specified in S5.3(b):

(1) The structural components in the pelvic restraint shall withstand a force of not less than 2,500 pounds or 1,139 kilograms.

(2) The structural components in the upper torso restraint shall withstand a force of not less than 1,500 pounds or 680 kilograms.

(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a force of not less than 3,000 pounds or 1,360 kilograms.

(4) The length of the pelvic restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 2,500 pounds or 1,130 kilograms.

(5) The length of the upper torso restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 1,500 pounds or 680 kilograms.

(6) Any webbing cut by the hardware during test shall have a breaking strength of not less than 3,500 pounds or 1,590 kilograms at a cut in webbing of the pelvic restraint, or not less than 2,800 pounds or 1,270 kilograms at a cut in webbing of the upper torso restraint.

(7) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

S5. Demonstration Procedures.

S5.1 *Webbing.* (a) *Width.* The width of webbing from three seat belt assemblies shall be measured after conditioning for at least 24 hours in an atmosphere having relative humidity between 48 and 67 percent and a temperature of $23 \pm 2^\circ$ C. or $73.4 \pm 3.6^\circ$ F. The tension during measurement of width shall be not more

than 5 pounds or 2 kilograms on webbing from a Type 1 seat belt assembly, and $2,200 \pm 100$ pounds or $1,000 \pm 50$ kilograms on webbing from a Type 2 seat belt assembly. The width of webbing from a Type 2 seat belt assembly may be measured during the breaking strength test described in paragraph (b) of this section.

(b) *Breaking strength.* Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of suitable capacity verified to have an error or not more than 1 percent in the range of the breaking strength of the webbing by the Tentative Methods of Verification of Testing Machines, ASTM Designation: E4-64, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

The machine shall be equipped with split drum grips illustrated in Figure 1, having a diameter between 2 and 4 inches or 5 and 10 centimeters. The rate of grip separation shall be between 2 and 4 inches per minute or 5 and 10 centimeters per minute. The distance between the centers of the grips at the start of the test shall be between 4 and 10 inches or 10 and 25 centimeters. After placing the specimen in the grips, the webbing shall be stretched continuously at a uniform rate to failure. Each value shall be not less than the applicable breaking strength requirement in S4.2(b), but the median value shall be used for determining the retention of breaking strength in paragraphs (d), (e), and (f) of this section.

(c) *Elongation.* Elongation shall be measured during the breaking strength test described in paragraph (b) of this section by the following procedure: A preload between 44 and 55 pounds or 20 and 25 kilograms shall be placed on the webbing mounted in the grips of the testing machine and the needle points of an extensometer, in which the points remain parallel during test, are inserted in the center of the specimen. Initially the points shall be set at a known distance apart between 4 and 8 inches or 10 and 20 centimeters. When the force on the webbing reaches the value specified in S4.2(c), the increase in separation of the points of the extensometer shall be measured and the percent elongation shall be calculated to the nearest 0.5 percent. Each value shall be not more than the appropriate elongation requirement in S4.2(c).

(d) *Resistance to abrasion.* The webbing from three seat belt assemblies shall be tested for resistance to abrasion by rubbing over the hexagon bar prescribed in Figure 2 in the following manner: The webbing shall be mounted

in the apparatus shown schematically in Figure 2. One end of the webbing (A) shall be attached to a weight (B) which has a mass of 5.2 ± 0.1 pounds or 2.35 ± 0.05 kilograms, except that a mass of 3.3 ± 1 pounds ($1.5 \pm .05$ kg) shall be used for webbing in pelvic and upper torso restraints of a belt assembly used in a child restraint system. The webbing shall be passed over the two new abrading edges of the hexagon bar (C) and the other end attached to an oscillating drum (D) which has a stroke of 13 inches or 33 centimeters. Suitable guides shall be used to prevent movement of the webbing along the axis of hexagonal bar C. Drum D shall be oscillated for 5,000 strokes or 2,500 cycles at a rate of 60 ± 2 strokes per minute or 30 ± 1 cycles per minutes. The abraded webbing shall be conditioned as prescribed in paragraph (a) of this section and tested for breaking strength by the procedure described in paragraph (b) of this section. The median values for the breaking strengths determined on abraded and unabraded specimens shall be used to calculate the percentage of breaking strength retained.

(e) *Resistance to light.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in recommended Practice for Operation of Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Artificial Weathering Test, ASTM Designation: E42-64, published by the American Society for Testing and Materials. The apparatus shall be operated without water spray at an air temperature of $60 \pm 2^\circ$ C. or $140 \pm 3.6^\circ$ F. measured at a point 1 ± 0.2 inch or 25 ± 5 millimeters outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to the light from the carbon arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The color-fastness of the exposed and conditioned specimens shall be determined on the Geometric Gray Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

(f) *Resistance to micro-organisms.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be subjected

successively to the procedures prescribed in Section 1C1—Water Leaching, Section 1C2—Volatilization, and Section 1B3—Soil Burial Test of AATCC Tentative Test Method 30—1957T, Fungicides, Evaluation of Textiles; Mildew and Rot Resistance of Textiles, published by American Association of Textile Chemists and Colorists. After soil-burial for a period of 2 weeks, the specimen shall be washed in water, dried and conditioned as prescribed in paragraph (a) of this section. The breaking strengths of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

Note.—This test shall not be required on webbing made from material which is inherently resistant to micro-organisms.

(g) *Colorfastness to crocking.* Webbing from three seat belt assemblies shall be tested by the procedure specified in Standard Test Method 8—1961, Colorfastness to Crocking (Rubbing) published by the American Association of Textile Chemists and Colorists.

(h) *Colorfastness to staining.* Webbing from three seat belt assemblies shall be tested by the procedure specified in Standard Test Method 107—1962, Colorfastness to Water, published by the American Association of Textile Chemists and Colorists, with the following modifications: Distilled water shall be used, perspiration tester shall be used, the drying time in paragraph 4 of procedures shall be 4 hours, and section entitled "Evaluation Method for Staining (3)" shall be used to determine colorfastness to staining on the AATCC Chart for Measuring Transference of Colors.

S5.2 Hardware.—(a) *Corrosion resistance.* Three seat belt assemblies shall be tested by Standard Method of Salt Spray (Fog) Testing, ASTM Designation: B 117-64, published by the American Society for Testing and Materials. The period of test shall be 50 hours for all attachment hardware at or near the floor, consisting of two periods of 24 hours exposure to salt spray followed by 1 hour drying and 25 hours for all other hardware, consisting of one period of 24 hours exposure to salt spray followed by 1 hour drying. In the salt spray test chamber, the parts from the three assemblies shall be oriented differently, selecting those orientations most likely to develop corrosion on the larger areas. At the end of test, the seat belt assembly shall be washed

thoroughly with water to remove the salt. After drying for at least 24 hours under standard laboratory conditions specified in S5.1(a) attachment hardware shall be examined for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 0.75 inch or 2 centimeters in diameter, and other hardware shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the hardware.

Note.—When attachment and other hardware are permanently fastened, by sewing or other means, to the same piece of webbing, separate assemblies shall be used to test the two types of hardware. The test for corrosion resistance shall not be required for attachment hardware made from corrosion-resistant steel containing at least 11.5 percent chromium or for attachment hardware protected with an electrodeposited coating of nickel, or copper and nickel, as prescribed in S4.3(a). The assembly that has been used to test the corrosion resistance of the buckle shall be used to measure adjustment force, tilt-lock adjustment, and buckle latch in paragraphs (e), (f), and (g), respectively, of this section, assembly performance in S5.3 and buckle release force in paragraph (d) of this section.

(b) *Temperature resistance.* Three seat belt assemblies having plastic or nonmetallic hardware or having retractors shall be subjected to the conditions prescribed in Procedure IV of Standard Methods of Test for Resistance of Plastics to Accelerated Service Conditions published by the American Society for Testing and Materials, under designation D 756-56. The dimension and weight measurement shall be omitted. Buckles shall be unlatched and retractors shall be fully retracted during conditioning. The hardware parts after conditioning shall be used for all applicable tests in S4.3 and S4.4.

(c) *Attachment hardware.* (1) Attachment bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall be tested in a manner similar to that shown in Figure 3. The load shall be applied at an angle of 45° to the axis of the bolt through attachment hardware from the seat belt assembly, or through a special fixture which simulates the loading applied by the attachment hardware. The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7/16-20 UNF-2B or 1/2-13 UNC-2B threaded hole in a hardened steel plate at least 0.4 inch or 1 centimeter in thickness. The bolt shall be installed with two full threads

exposed from the fully seated position. The appropriate force required by S4.3(c) shall be applied. A bolt from each of three seat belt assemblies shall be tested.

(2) Attachment hardware, other than bolts, designed to receive the ends of two seat belt assemblies shall be subjected to a tensile force of 6,000 pounds or 2,720 kilograms in a manner simulating use. The hardware shall be examined for fracture after the force is released. Attachment hardware from three seat belt assemblies shall be tested.

(3) Single attachment hook for connecting webbing to any eye bolt shall be tested in the following manner: The hook shall be held rigidly so that the retainer latch or keeper, with cotter pin or other locking device in place, is in a horizontal position as shown in Figure 4. A force of 150±2 pounds or 68±1 kilograms shall be applied vertically as near as possible to the free end of the retainer latch, and the movement of the latch by this force at the point of application shall be measured. The vertical force shall be released, and a force of 150±2 pounds or 68±1 kilograms shall be applied horizontally as near as possible to the free end of the retainer latch. The movement of the latch by this force at the point of load application shall be measured. Alternatively, the hook may be held in other positions, provided the forces are applied and the movements of the latch are measured at the points indicated in Figure 4. A single attachment hook from each of three seat belt assemblies shall be tested.

(d) *Buckle release.* (1) Three seatbelt assemblies shall be tested to determine compliance with the maximum buckle release force requirements, following the assembly test in S5.3. After subjection to the force applicable for the assembly being tested, the force shall be reduced and maintained at 150 pounds on the assembly loop of a Type 1 seatbelt assembly, 75 pounds on the components of a Type 2 seatbelt assembly. The buckle release force shall be measured by applying a force on the buckle in a manner and direction typical of those which would be employed by a seatbelt occupant. For pushbutton-release buckles, the force shall be applied at least 0.125 inch from the edge of the pushbutton access opening of the buckle in a direction that produces maximum releasing effect. For lever-release buckles, the force shall be applied on the centerline of the buckle lever or finger tab in a direction that produces maximum releasing effect.

(2) The area for application of release force on pushbutton actuated buckle

shall be measured to the nearest 0.05 square inch or 0.3 square centimeter. The cylinder specified in S4.3(d) shall be inserted in the actuation portion of a lever released buckle for determination of compliance with the requirement. A buckle with other release actuation shall be examined for access of release by fingers.

(3) The buckle of a Type 1 or Type 2 seatbelt assembly shall be subjected to a compressive force of 400 pounds applied anywhere on a test line that is coincident with the centerline of the belt extended through the buckle or on any line that extends over the center of the release mechanism and intersects the extended centerline of the belt at an angle of 60°. The load shall be applied by using a curved cylindrical bar having a cross section diameter of 0.75 inch and a radius of curvature of 6 inches, placed with its longitudinal centerline along the test line and its center directly above the point on the buckle to which the load will be applied. The buckle shall be latched, and a tensile force of 75 pounds shall be applied to the connected webbing during the application of the compressive force. Buckles from three seatbelt assemblies shall be tested to determine compliance with paragraph S4.3(d)(3).

(e) *Adjustment force.* Three seat belt assemblies shall be tested for adjustment force on the webbing at the buckle, or other manual adjusting device normally used to adjust the size of the assembly. With no load on the anchor end, the webbing shall be drawn through the adjusting device at a rate of 20±2 inches per minute or 50±5 centimeters per minute and the maximum force shall be measured to the nearest 0.25 pound or 0.1 kilogram after the first 1 inch or 25 millimeters of webbing movement. The webbing shall be precycled 10 times prior to measurement.

(f) *Tilt-lock adjustment.* This test shall be made on buckles or other manual adjusting devices having tilt-lock adjustment normally used to adjust the size of the assembly. Three buckles or devices shall be tested. The base of the adjustment mechanism and the anchor end of the webbing shall be oriented in planes normal to each other. The webbing shall be drawn through the adjustment mechanism in a direction to increase belt length at a rate of 20±2 inches per minute or 50±5 centimeters per minute while the plane of the base is slowly rotated in a direction to lock the webbing. Rotation shall be stopped when the webbing locks, but the pull on the webbing shall be continued until there is a resistance of at least 20

pounds or 9 kilograms. The locking angle between the anchor end of the webbing and the base of the adjustment mechanism shall be measured to the nearest degree. The webbing shall be precycled 10 times prior to measurement.

(g) *Buckle latch.* The buckles from three seat belt assemblies shall be opened fully and closed at least 10 times. Then the buckles shall be clamped or firmly held against a flat surface so to permit normal movement of buckle part, but with the metal mating plate (metal-to-metal buckles) or webbing and (metal-to-webbing buckles) withdrawn from the buckle. The release mechanism shall be moved 200 times through the maximum possible travel against its stop with a force of 30±3 pounds or 14±1 kilograms at a rate not to exceed 30 cycles per minute. The buckle shall be examined to determine compliance with the performance requirements of S4.3(g). A metal-to-metal buckle shall be examined to determine whether partial engagement is possible by means of any technique representative of actual use. If partial engagement is possible, the maximum force of separation when in such partial engagement shall be determined.

(h) *Nonlocking retractor.* After the retractor is cycled 10 times by full extension and retraction of the webbing, the retractor and webbing shall be suspended vertically and a force of 4 pounds or 1.8 kilograms shall be applied to extend the webbing from the retractor. The force shall be reduced to 3 pounds or 1.4 kilograms when attached to a pelvic restraint, or to 1.1 pounds or 0.5 kilogram per strap or webbing that contacts the shoulder of an occupant when retractor is attached to an upper torso restraint. The residual extension of the webbing shall be measured by manual rotation of the retractor drum or by disengaging the retraction mechanism. Measurements shall be made on three retractors. The location of the retractor attached to upper torso restraint shall be examined for visibility of reel during use of seat belt assembly in a vehicle.

Note.—This test shall not be required on a nonlocking retractor attached to the free-end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* Three retractors shall be tested in a manner to permit the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the

retractor. While the webbing is being retracted, the average force or retraction within plus or minus 2 inches or 5 centimeters of 75 percent extension (25 percent retraction) shall be determined and the webbing movement between adjacent locking segments shall be measured in the same region of extension. A seat belt assembly with automatic locking retractor in upper torso restraint shall be tested in a vehicle in a manner prescribed by the installation and usage instructions. The retraction force on the occupant of the seat belt assembly shall be determined before and after traveling for 10 minutes at a speed of 15 miles per hour or 24 kilometers per hour or more over a rough road (e.g., Belgian block road) where the occupant is subjected to displacement with respect to the vehicle in both horizontal and vertical directions. Measurements shall be made with the vehicle stopped and the occupant in the normal seated position.

(j) *Emergency-locking retractor.* A retractor shall be tested in a manner that permits the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the retractor, passing over or through any hardware or other material specified in the installation instructions. While the webbing is being retracted, the lowest force of retraction within plus or minus 2 inches of 75 percent extension shall be determined. A retractor that is sensitive to webbing withdrawal shall be subjected to an acceleration of 0.3g within a period of 50 ms. while the webbing is at 75 percent extension, to determine compliance with S4.3(j)(2). The retractor shall be subjected to an acceleration of 0.7g within a period of 50 milliseconds, while the webbing is at 75 percent extension, and the webbing movement before locking shall be measured under the following conditions: For a retractor sensitive to webbing withdrawal, the retractor shall be accelerated in the direction of webbing retraction while the retractor drum's central axis is oriented horizontally and at angles of 45°, 90°, 135°, and 180° to the horizontal plane. For a retractor sensitive to vehicle acceleration, the retractor shall be—

(1) Accelerated in the horizontal plane in two directions normal to each other, while the retractor drum's central axis is oriented at the angle at which it is installed in the vehicle; and,

(2) Accelerated in three directions normal to each other while the retractor drum's central axis is oriented at angles of 45°, 90°, 135°, and 180° from the angle

at which it is installed in the vehicle, unless the retractor locks by gravitational force when tilted in any direction to any angle greater than 45° from the angle at which it is installed in the vehicle.

(k) *Performance of retractor.* After completion of the corrosion-resistance test described in paragraph (a) of this section, the webbing shall be fully extended and allowed to dry for at least 24 hours under standard laboratory conditions specified in S5.1(a). The retractor shall be examined for ferrous and non-ferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the retractor, and for ferrous corrosion on significant surfaces if the retractor is part of the attachment hardware. The webbing shall be withdrawn manually and allowed to retract for 25 cycles. The retractor shall be mounted in an apparatus capable of extending the webbing fully, applying a force of 20 pounds or 9 kilograms at full extension, and allowing the webbing to retract freely and completely. The webbing shall be withdrawn from the retractor and allowed to retract repeatedly in this apparatus until 2,500 cycles are completed. The retractor and webbing shall then be subjected to the temperature resistance test prescribed in paragraph (b) of this section. The retractor shall be subjected to 2,500 additional cycles of webbing withdrawal and retraction. Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 8 containing about 2 pounds or 0.9 kilogram of coarse grade dust conforming to the specification given in SAE Recommended Practice, Air Cleaner Test Code—SAE J726a, published by the Society of Automotive Engineers. The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gage pressure of 80 ± 8 pounds per square inch or 5.6 ± 0.6 kilograms per square centimeter entering through an orifice 0.060 ± 0.004 inch or 1.5 ± 0.1 millimeters in diameter. The webbing shall be extended to the top of the chamber and kept extended at all times except that the webbing shall be subjected to 10 cycles of complete retraction and extension within 1 to 2 minutes after each agitation of the dust. At the end of 5 hours, the assembly shall be removed from the chamber. The webbing shall be fully withdrawn from the retractor manually and allowed to retract completely for 25 cycles. An automatic-locking retractor or a

nonlocking retractor attached to pelvic restraint shall be subjected to 5,000 additional cycles of webbing withdrawal and retraction. An emergency-locking retractor or a nonlocking retractor attached to upper torso restraint shall be subjected to 45,000 additional cycles of webbing withdrawal and retraction between 50 and 100 percent extension. The locking mechanism of an emergency locking retractor shall be actuated at least 10,000 times within 50 to 100 percent extension of webbing during the 50,000 cycles. At the end of test, compliance of the retractors with applicable requirements in S4.3 (h), (i), and (j) shall be determined. Three retractors shall be tested for performance.

S5.3 Assembly Performance—(a) Type 1 seat belt assembly. Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

(1) The testing machine shall conform to the requirements specified in S5.1(b). A double-roller block shall be attached to one head of the testing machine. This block shall consist of two rollers 4 inches or 10 centimeters in diameter and sufficiently long so that no part of the seat belt assembly touches parts of the block other than the rollers during test. The rollers shall be mounted on antifriction bearings and spaced 12 inches or 30 centimeters between centers, and shall have sufficient capacity so that there is no brinelling, bending or other distortion of parts which may affect the results. An anchorage bar shall be fastened to the other head of the testing machine.

(2) The attachment hardware furnished with the seat belt assembly shall be attached to the anchorage bar. The anchor points shall be spaced so that the webbing is parallel in the two sides of the loop. The attaching bolts shall be parallel to, or at an angle of 45° or 90° to the webbing, whichever results in an angle nearest to 90° between webbing and attachment hardware except that eye bolts shall be vertical, and attaching bolts or nonthreaded anchorages of a seat belt assembly designed for use in specific models of motor vehicles shall be installed to produce the maximum angle in use indicated by the installation instructions, utilizing special fixtures if necessary to simulate installation in the motor vehicle. Rigid adapters between anchorage bar and attachment hardware shall be used if necessary to locate and orient the adjustment

hardware. The adapters shall have a flat support face perpendicular to the threaded hole for the attaching bolt and adequate in area to provide full support for the base of the attachment hardware connected to the webbing. If necessary, a washer shall be used under a swivel plate or other attachment hardware to prevent the webbing from being damaged as the attaching bolt is tightened.

(3) The length of the assembly loop from attaching bolt to attaching bolt shall be adjusted to about 51 inches or 130 centimeters, or as near thereto as possible. A force of 55 pounds or 25 kilograms shall be applied to the loop to remove any slack in webbing at hardware. The force shall be removed and the heads of the testing machine shall be adjusted for an assembly loop between 48 and 50 inches or 122 and 127 centimeters in length. The length of the assembly loop shall then be adjusted by applying a force between 20 and 22 pounds or 9 and 10 kilograms to the free end of the webbing at the buckle, or by the retraction force of an automatic-locking or emergency-locking retractor. A seat belt assembly that cannot be adjusted to this length shall be adjusted as closely as possible. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The buckle shall be in a location so that it does not touch the rollers during test, but to facilitate making the buckle release test in S5.2(d) the buckle should be between the rollers or near a roller in one leg.

(4) The heads of the testing machine shall be separated at a rate between 2 and 4 inches per minute or 5 and 10 centimeters per minute until a force of $5,000 \pm 50$ pounds or $2,270 \pm 20$ kilograms is applied to the assembly loop. The extension of the loop shall be determined from measurements of head separation before and after the force is applied. The force shall be decreased to 150 ± 10 pounds or 68 ± 4 kilograms and the buckle release force measured as prescribed in S5.2(d).

(5) After the buckle is released, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width, the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly

shall be used with the webbing repositioned in the hardware. A tensile force of $2,500 \pm 25$ pounds or $1,135 \pm 10$ kilograms shall be applied to the components or a force of $5,000 \pm 50$ pounds or $2,270 \pm 20$ kilograms shall be applied to an assembly loop. After the force is removed, the breaking strength of the cut webbing shall be determined as prescribed above.

(6) If a Type 1 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor, the webbing and retractor shall be subjected to a tensile force of $2,500 \pm 25$ pounds or $1,135 \pm 10$ kilograms with the webbing fully extended from the retractor.

(7) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(b) *Type 2 seat belt assembly.* Components of three seat belt assemblies shall be tested in the following manner:

(1) The pelvic restraint between anchorages shall be adjusted to a length between 48 and 50 inches or 122 and 127 centimeters, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a)(2) of this section and illustrated in Figure 5. A tensile force of $2,500 \pm 25$ pounds or $1,135 \pm 10$ kilograms shall be applied on the components in any convenient manner and the extension between anchorages under this force shall be measured. The force shall be reduced to 75 ± 5 pounds or 34 ± 2 kilograms and the buckle release force measured as prescribed in S5.2(d).

(2) The components of the upper torso restraint shall be subjected to a tensile force of $1,500 \pm 15$ pounds or 680 ± 5 kilograms following the procedure prescribed above for testing pelvic restraint and the extension between anchorages under this force shall be measured. If the testing apparatus permits, the pelvic and upper torso restraints may be tested simultaneously. The force shall be reduced to 75 ± 5 pounds or 34 ± 2 kilograms and the buckle release force measured as prescribed in S5.2(d).

(3) Any component of the seat belt assembly common to both pelvic and upper torso restraint shall be subjected

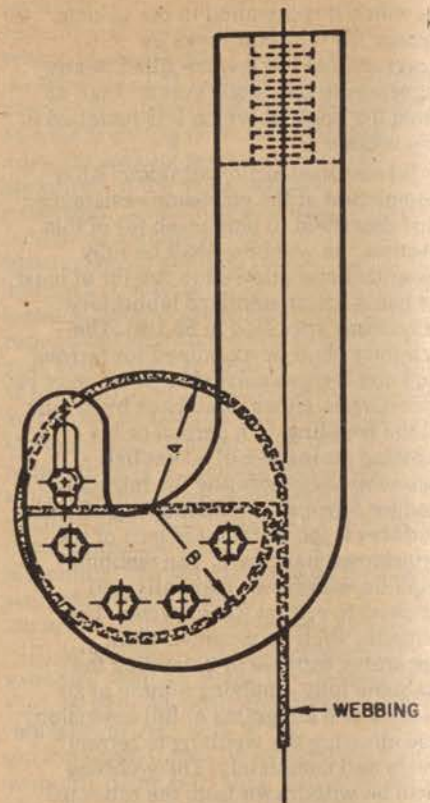
to a tensile force of $3,000 \pm 30$ pounds or $1,360 \pm 15$ kilograms.

(4) After the buckle is released in tests of pelvic and upper torso restraints, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly shall be used with the webbing repositioned in the hardware. The force applied shall be $2,500 \pm 25$ pounds or $1,135 \pm 10$ kilograms for components of pelvic restraint, and $1,500 \pm 15$ pounds or 680 ± 5 kilograms for components of upper torso restraint. After the force is removed the breaking strength of the cut webbing shall be determined as prescribed above.

(5) If a Type 2 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor the webbing and retractor shall be subjected to a tensile force of $2,500 \pm 25$ pounds or $1,135 \pm 10$ kilograms with the webbing fully extended from the retractor, or to a tensile force of $1,500 \pm 15$ pounds or 680 ± 5 kilograms with the webbing fully extended from the retractor if the design of the assembly permits only upper torso restraint forces on the retractor.

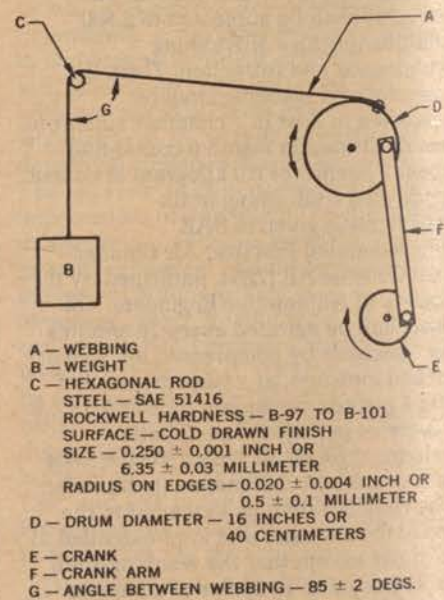
(6) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(c) *Resistance to buckle abrasion.* Seatbelt assemblies shall be tested for resistance to abrasion by each buckle or manual adjusting device normally used to adjust the size of the assembly. The webbing of the assembly to be used in this test shall be exposed for 4 hours to an atmosphere having relative humidity of 65 percent and temperature of 70°F . The webbing shall be pulled back and forth through the buckle or manual adjusting device as shown schematically in Figure 9. The anchor end of the webbing (A) shall be attached to a weight (B) of 3 pounds. The webbing shall pass through the buckle (C), and the other end (D) shall be attached to a reciprocating device so that the webbing forms an angle of 8° with the hinge stop (E). The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 8 inches. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b).



A 1 TO 2 INCHES OR 2.5 TO 5 CENTIMETERS
B A MINUS 0.06 INCH 0.15 CENTIMETER

FIGURE 1



A — WEBBING
B — WEIGHT
C — HEXAGONAL ROD
STEEL — SAE 51416
ROCKWELL HARDNESS — B-97 TO B-101
SURFACE — COLD DRAWN FINISH
SIZE — 0.250 ± 0.001 INCH OR
 6.35 ± 0.03 MILLIMETER
RADIUS ON EDGES — 0.020 ± 0.004 INCH OR
 0.5 ± 0.1 MILLIMETER
D — DRUM DIAMETER — 16 INCHES OR
40 CENTIMETERS
E — CRANK
F — CRANK ARM
G — ANGLE BETWEEN WEBBING — 85 ± 2 DEGS.

FIGURE 2

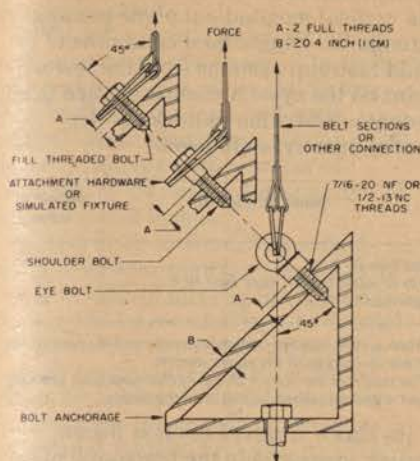


FIGURE 3

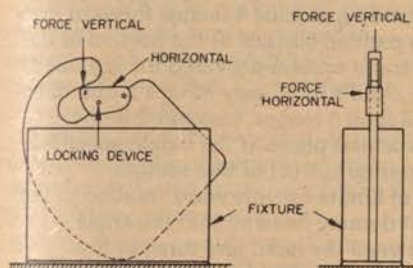
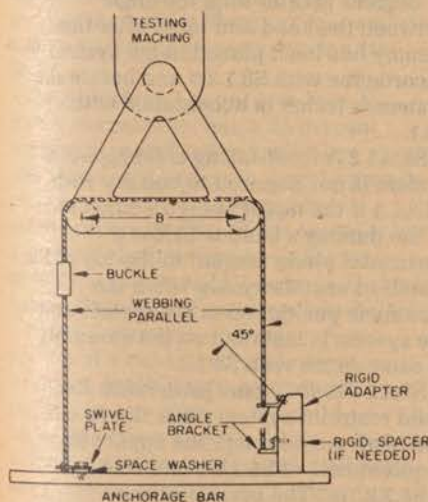
FIGURE 4
SINGLE ATTACHMENT HOOK

FIGURE 5

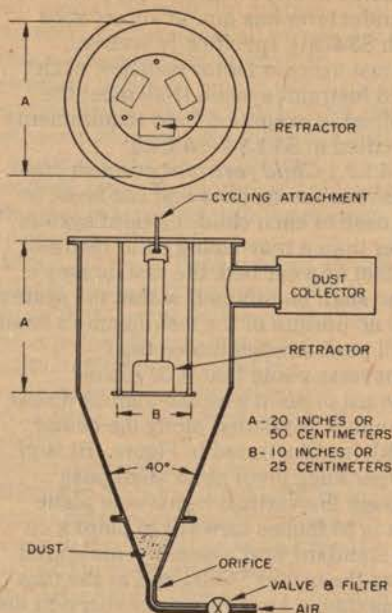


FIGURE 8

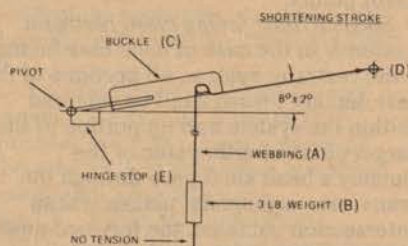
[34 F.R. 115
January 4, 1969]

FIGURE 9

§ 571.213 [Amended]

2. Section S4 of Standard No. 213, Child Seating Systems (49 CFR 571.213), is amended to read as follows:

S4. *Requirements.* Each child seating system manufacturer before June 1, 1980, shall meet, at the option of the manufacturer, either the requirements of S4.1 through S4.11 of this standard, or the requirements of § 571.213 of this part (Standard No. 213, Child Restraint Systems).

3. A new Federal Motor Vehicle Safety Standard No. 213, Child Restraint Systems, would be added to read as set forth below.

§ 571.213080 Standard No. 213; child restraint systems.

S1. *Scope.* This standard specifies requirements for child restraint systems used in motor vehicles.

S2. *Purpose.* The purpose of this standard is to reduce the number of children killed or injured in motor vehicle crashes.

S3. *Application.* This standard applies to child restraint systems for use in motor vehicles.

S4. Definitions.

"Car bed" means a child restraint system designed to restrain or position a child in the supine or prone position on a continuous flat surface.

"Child restraint system" means any device, except Type I or Type II seat belts, designed for use in a motor vehicle to restrain, seat, or position children who weigh not more than 50 pounds.

"Contactable surface" means any child restraint system surface (other than that of a belt, belt buckle, or belt adjustment hardware) that may contact any part of the head or torso of the appropriate test dummy, specified in S7, when a child restraint system is tested in accordance with S6.1.

"Seat orientation reference line" or "SORL" means the horizontal line through Point Z as illustrated in Figure 1A.

"Torso" means the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the child restraint system seating surface and the top of the shoulders of the test dummy.

S5. Requirements. Each child restraint system shall meet the requirements in this section when, as specified, tested in accordance with S6.1.

S5.1 Dynamic performance.

S5.1.1 Child restraint system integrity. When tested in accordance with S6.1, each child restraint system shall:

(a) Exhibit no complete separation of any load bearing structural element and no partial separation exposing either surfaces with a radius of less than 1/4 inch or surfaces with protrusions greater than 3/8 inch above the immediate adjacent surrounding contactable surface of any structural element of the system;

(b) If adjustable to different positions, remain in the same adjustment position during the testing as it was immediately before the testing; and

(c) If a front facing child restraint system, not allow the angle between the system's back support surfaces for the child and the system's seating surface to be less than 45 degrees at the completion of the test.

S5.1.2 Injury criteria. When tested in accordance with S6.1, each child restraint system that, in accordance with S5.5.2(f), is recommended for use by children weighing more than 20 pounds, shall—

(a) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy head as specified in Part 572 such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} (t_2 - t_1)$$

shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two moments during the impacts.

(b) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy upper thorax as specified in Part 572 to not more than 60 g 's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S5.1.3 Occupant excursion. When tested in accordance with S6.1 and

adjusted in any position which the manufacturer has not, in accordance with S5.5.2(i), specifically warned against using in motor vehicles, each child restraint system shall meet the applicable excursion limit requirements specified in S5.1.3.1–S5.1.3.3.

S5.1.3.1 Child restraint systems other than rear-facing ones and car beds. In the case of each child restraint system other than a rear-facing child restraint system or a car bed, the test dummy's torso shall be retained within the system and no portion of the test dummy's head shall pass through the vertical transverse plane that is 32 inches forward of point z on the standard seat assembly, measured along the center SORL (as illustrated in Figure 1B), and neither knee pivot point shall pass through the vertical transverse plane that is 36 inches forward of point z on the standard seat assembly, measured along the center SORL, and at the time of maximum knee forward excursion the forward rotation of the dummy's torso from the dummy's initial seating configuration shall be at least 15° measured in the sagittal plane along the line connecting the shoulder and hip pivot points.

S5.1.3.2 Rear-facing child restraint systems. In the case of each rear-facing child restraint system, all portions of the test dummy's torso shall be retained within the system and no portion of the target point on either side of the dummy's head shall pass through the transverse orthogonal planes whose intersection contains, the forward-most and top-most points on the child restraint system surfaces (illustrated in Figure 1C).

S5.1.3.3 Car beds. In the case of car beds, all portions of the test dummy's head and torso shall be retained within the confines of the car bed.

S5.1.4 Back support angle. When a rear-facing child restraint system is tested in accordance with S6.1, the angle between the system's back support surface for the child and the vertical shall not exceed 70 degrees.

S5.2 Force distribution.

S5.2.1 Minimum head support surface—child restraints other than car beds.

S5.2.1.1 Except as provided in S5.2.1.2, each child restraint system other than a car bed shall provide restraint against rearward movement of the head of the child (rearward in relation to the child) by means of a continuous seat back which is an integral part of the system and which—

(a) Has a height, measured along the

system seat back surface for the child in the vertical longitudinal plane passing through the longitudinal centerline of the child restraint systems from the lowest point on the system seating surface that is contacted by the buttocks of the seated dummy, as follows:

Weight (in pounds)	Height ¹ (in inches)
Less than 20 lb.....	18
20 lb or more, but not more than 40 lb.....	20
More than 40 lb.....	22

¹ When a child restraint system is recommended under S5.5(f) for use by children of the above weights.

² The height of the portion of the system seat back providing head restraint shall not be less than the above.

(b) Has a width of not less than 8 inches, measured in the horizontal plane at the height specified in paragraph (a) of this section. Except that a child restraint system with side supports extending at least 4 inches forward from the padded surface of the portion of the restraint system provided for support of the child's head may have a width of not less than 6 inches, measured in the horizontal plane at the height specified in paragraph (a) of this section.

(c) Limits the rearward rotation of the test dummy head so that the angle between the head and torso of the dummy specified in S7 when tested in accordance with S6.1 is not more than 45 degrees greater than the angle between the head and torso after the dummy has been placed in the system in accordance with S6.1.2.3 and before the system is tested in accordance with S6.1.

S5.2.1.2 A front-facing child restraint system is not required to comply with S5.2.1.1 if the target point on either side of the dummy's head is below a horizontal plane tangent to the top of the standard seat assembly when the dummy is positioned in the system and the system is installed on the assembly in accordance with S6.1.2.

S5.2.2 Torso impact protection. Each child restraint system other than a car bed shall comply with the applicable requirements of S5.2.2.1 and S5.2.2.2.

S5.2.2.1(a) The system surface provided for the support of the child's back shall be flat or concave and have a continuous surface area of not less than 85 square inches.

(b) Each system surface provided for support of the side of the child's torso shall be flat or concave and have a continuous surface of not less than 24 square inches for systems recommended for children weighing 20 pounds or more, or 48 square inches for systems

recommended for children weighing less than 20 pounds.

(c) Each horizontal cross section of each system surface designed to restrain forward movement of the child's torso shall be flat or concave and each vertical longitudinal cross section shall be flat or convex with a radius of curvature of the underlying structure of not less than 3 inches.

S5.2.2.2 Each forward facing child restraint system shall have no fixed or movable surface directly forward of the dummy and intersected by a horizontal line parallel to the SORL and passing through any portion of the dummy, except for surfaces which restrain the dummy when the system is tested in accordance with S6.1.2.1.2 so that the child restraint system shall conform to the requirements of S5.1.2 and S5.1.3.1.

S5.2.3 Head impact protection.

S5.2.3.1 Each child restraint system, other than a child harness, which is recommended under S5.5.2(f) for children weighing less than 20 pounds shall comply with S5.2.3.2.

S5.2.3.2 Each system surface which is contactable by the dummy head when the system is tested in accordance with S6.1 shall be covered with slow recovery, energy absorbing material with the following characteristics:

(a) A 25 percent compression-deflection resistance of not less than 0.5 and not more than 10 pounds per square inch when tested in accordance with S6.3.

(b) A thickness of not less than $\frac{1}{2}$ inch if the material has a 25 percent compression-deflection resistance of not less than 3 and not more than 10 pounds per square inch when tested in accordance with S6.3. If the material has a 25 percent compression-deflection resistance of less than 3 pounds, it shall have a thickness of not less than $\frac{3}{4}$ inch.

S5.2.4 Protrusion limitation. Any portion of a rigid structural component within or underlying a contactable surface, or any portion of a child restraint system surface that is subject to the requirements of S5.2.3 shall, with any padding or other flexible overlay material removed, have a height above any immediately adjacent restraint system surface of not more than $\frac{3}{8}$ inch and no exposed edge with a radius of less than $\frac{1}{4}$ inch.

S5.3 Installation.

S5.3.1 Each child restraint system shall have no means designed for attaching the system to a vehicle seat cushion or vehicle seat back and no component (except belts) that is designed to be inserted between the vehicle seat cushion and vehicle seat back.

S5.3.2 When installed on a vehicle seat, each child restraint system, other than child harnesses, shall be capable of being restrained against forward movement solely by means of a Type I seat belt assembly (defined in S571.209) that meets Standard No. 208 (S571.208), or by means of a Type I seat belt assembly plus one additional anchorage strap that is supplied with the system and conforms to S5.4.

S5.3.3 Car beds. Each car bed shall be designed to be installed on a vehicle seat so that the car bed's longitudinal axis is perpendicular to a vertical longitudinal plane through the longitudinal axis of the vehicle.

S5.4 Belts, belt buckles, and belt webbing.

S5.4.1 Performance requirements. The webbing of belts provided with a child restraint system and used to attach the system to the vehicle or to restrain the child within the system shall—

(a) After being subjected to abrasion as specified in S5.1(d) of FMVSS No. 209 (S571.209), have a breaking strength of not less than 75 percent of the strength of the unabraded webbing when tested in accordance with S5.1(b) of FMVSS No. 209.

(b) Meet the requirements of S4.2 (e) through (h) of FMVSS No. 209 (S571.209); and

(c) If contactable by the test dummy torso when the system is tested in accordance with S6.1, have a width of not less than $1\frac{1}{2}$ inches when measured in accordance with S5.4.1.1.

S5.4.1.1 Width test procedure. Condition the webbing for 24 hours in an atmosphere of any relative humidity between 48 and 67 percent, and any ambient temperature between 70° and 77° F. Measure belt webbing width under a tension of 5 pounds applied lengthwise.

S5.4.2 Belt buckles and belt adjustment hardware. Each belt buckle and item of belt adjustment hardware used in a child restraint system shall conform to the requirements of S4.3(a) and S4.3(b) of FMVSS No. 209 (S571.209).

S5.4.3 Belt Restraint.

S5.4.3.1 General. Each belt that is part of a child restraint system and that is designed to restrain a child using the system shall be adjustable to snugly fit any child whose height and weight are within the ranges recommended in accordance with S5.5.2(f) and who is positioned in the system in accordance with the instructions required by S5.6.

S5.4.3.2 Direct restraint. Each belt that is part of a child restraint system and that is designed to restrain a child using the system and to attach the system to the vehicle shall, when tested

in accordance with S6.1, impose no loads on the child that result from the mass of the system or the mass of the seat back of the standard seat assembly specified in S7.3.

S5.4.3.3 Seating systems. Except for child restraint systems subject to S5.4.3.4, each child restraint system that is designed for use by a child in a seated position and that has belts designed to restrain the child shall, with the test dummy specified in S7 positioned in the system in accordance with S6.1.2.3, provide:

(a) Upper torso restraint, including belts passing over each shoulder of the child;

(b) Lower torso restraint in the form of a lap belt assembly making an angle between 45° and 90° with the child restraint seating surface at the lap belt attachment points;

(c) In the case of each seating system recommended for children over 20 pounds, a crotch strap connectable to the lap belt or other device used to restrain the lower torso.

S5.4.3.4 Harnesses. Each child harness shall:

(a) Provide upper torso restraint, including belts passing over each shoulder of the child;

(b) Provide lower torso restraint by means of lap and crotch belt; and

(c) Prevent a child of any height for which the restraint is recommended for use pursuant to S5.5.2(f) from standing upright on the vehicle seat when the child is placed in the device in accordance with the instructions required by S5.6.

S5.4.3.5 Buckle Release. Any buckle in a child restraint system belt assembly designed to restrain a child using the system shall, when tested in accordance with S6.2, not release when a force of not more than 12 pounds is applied before the test specified in S6.1, and (b) release when a force of not more than 20 pounds is applied after the test specified in S6.1.

S5.5 Labeling.

S5.5.1 Each child restraint system shall be permanently labeled with the information specified in S5.5.2 (a) through (k).

S5.5.2 The information specified in paragraphs (a)–(k) of this section shall be stated in the English language and lettered in letters and numbers that are not smaller than 10 point type and are on a contrasting background.

(a) The model name or number of the system.

(b) The manufacturer's name. A distributor's name may be used instead if the distributor assumes responsibility for all duties and liabilities imposed on the manufacturer with respect to the

system by the National Traffic and Motor Vehicle Safety Act, as amended.

(c) The statement: "Manufactured in —," inserting the month and year of manufacture.

(d) The place of manufacture (city and State, or foreign country). However, if the manufacturer uses the name of the distributor, then it shall state the location (city and State, or foreign country) of the principal offices of the distributor.

(e) The statement: "This child restraint system conforms to all applicable Federal motor vehicle safety standards."

(f) The following statement, inserting the manufacturer's recommendations for the maximum weight and height of children who can safely occupy the system:

THIS CHILD RESTRAINT IS DESIGNED FOR USE ONLY BY CHILDREN WHO WEIGH BETWEEN — AND — POUNDS AND ARE BETWEEN — AND — INCHES IN HEIGHT.

(g) The following statement, inserting the location of the manufacturer's installation instruction booklet or sheet on the restraint:

WARNING! FAILURE TO FOLLOW EACH OF THE FOLLOWING INSTRUCTIONS CAN RESULT IN YOUR CHILD STRIKING THE VEHICLE'S INTERIOR DURING A SUDDEN STOP OR CRASH. SECURE THIS CHILD RESTRAINT WITH A VEHICLE BELT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS LOCATED —.

(h) In the case of each child restraint system that has belts designed to restrain children using them:

SNUGLY ADJUST THE BELTS PROVIDED WITH THIS CHILD RESTRAINT AROUND YOUR CHILD.

(i) In the case of each child restraint system which is not intended for use in motor vehicles at certain adjustment positions, the following statement, inserting the manufacturer's adjustment restrictions.

DO NOT USE THE — ADJUSTMENT POSITION(S) OF THIS CHILD RESTRAINT IN A MOTOR VEHICLE.

(j) In the case of each child restraint system equipped with an anchorage strap, the statement:

SECURE THE TOP ANCHORAGE STRAP PROVIDED WITH THIS CHILD RESTRAINT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS.

(k) In the case of each child restraint system which can be used in a rear-facing position:

PLACE THIS CHILD RESTRAINT IN A REAR-FACING POSITION WHEN USING IT WITH AN INFANT.

(l) An installation diagram showing the child restraint system installed in the right front outboard seating position equipped with a continuous-loop lap/shoulder belt and in the center rear seating position as specified in the manufacturer's instructions.

S5.5.3 The information specified in S5.5.2 (g)–(k) shall be located on the child restraint system so that it is visible when the system is installed as specified in S5.6.

S5.6 *Installation instructions.* Each child restraint system shall be accompanied by printed instructions in the English language that provide a step-by-step procedure, including diagrams, for installing the system in motor vehicles, securing the system in the vehicles, positioning a child in the system, and adjusting the system to fit the child.

S5.6.1 The instructions shall state that the rear center seating position is the safest seating position in most vehicles for installing a child restraint system.

S5.6.2 The instructions shall specify in general terms the types of vehicles, seating positions, and vehicle lap belts with which the system can or cannot be used.

S5.6.3 The instructions shall explain the primary consequences of noting following the warnings required to be labeled on the child restraint system in accordance with S5.5.2 (g)–(k).

S5.6.4 The instructions for each car bed shall explain that the car bed should position in such a way that the child's head is near the center of the vehicle.

S5.6.5 The instructions shall state that child restraint systems should be securely belted to the vehicle, even when they are not occupied, since in a crash an unsecured child restraint system may injure other occupants.

S5.6.6 Each child restraint system shall have a location on the restraint for storing the manufacturer's instructions.

S5.7 *Flammability.* Each material used in a child restraint system shall conform to the requirements of S4 of FMVSS No. 302 (S571.302).

S6 *Test Conditions and Procedures.*

S6.1 *Dynamic Systems Test.*

S6.1.1 *Test Conditions:*

S6.1.1.1 The test device is the standard seat assembly specified in S7.3. It is mounted on a dynamic test platform so that the center SORL of the seat is parallel to the direction of the test platform travel and so that movement between the base of the assembly and the platform is prevented. The platform is instrumented with an accelerometer and data processing system having a frequency response of 60 Hz channel class as specified in

Society of Automotive Engineers Recommended Practice J211a "Instrumentation for Impact Tests." The accelerometer sensitive axis is parallel to the direction of the test platform travel.

S6.1.1.2 The tests are frontal barrier impact simulations and for—

(a) Test configuration I specified in S6.1.2.1.1, are at a velocity change of 30 mph with the acceleration of the test platform entirely within the curve shown in figure 2.

(b) Test configuration II specified in S6.1.2.1.2, are at a velocity change of 20 mph with the acceleration of the test platform entirely within the curve shown in figure 3.

S6.1.1.3 Type I seat belt assemblies meeting the requirements of Standard No. 209 (S571.209) and having webbing with a width of not more than 2 inches are attached, without the use of retractors or reels of any kind, to the seat belt anchorage points (illustrated in Figure 1B) provided on the standard seat assembly.

S6.1.1.4 Performance tests under S6.1 are conducted at any ambient temperature from 66° to 78° F and at any relative humidity from 10 percent to 70 percent.

S6.1.2 *Dynamic Test Procedure.*

S6.1.2.1 *Test Configuration.*

S6.1.2.1.1 *Test Configuration I.* In the case of each child restraint system, install a new child restraint system at the center seat position of the standard seat assembly in accordance with the manufacturer's instructions provided in accordance with S5.6 with the system.

S6.1.2.1.2 *Test Configuration II.* In the case of each child restraint system, other than a child harness, which is equipped with an anchorage belt or a fixed or movable surface described in S5.2.2.2, install a new child restraint system at the center seat position of the standard seat assembly using only the standard seat lap belt to secure the system to the standard seat.

S6.1.2.2 Tighten all belts used to attach the child restraint system to the standard seat assembly to a tension of not less than 12 pounds and not more than 15 pounds, as measured by a load cell used on the webbing portion of the belt.

S6.1.2.3 Place in the child restraint any dummy specified in S7 for testing systems for use by children of the heights and weights for which the system is recommended in accordance with S5.6.

S6.1.2.3.1 When placing the 3-year-old test dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning

provided by the manufacturer with the system in accordance with S5.6 while conforming to the following:

(a) Place the test dummy in the seated position within the system with the midsagittal plane of the test dummy head coincident with the center SORL of the standard seating assembly, holding the torso upright until it contacts the system's design seating surface.

(b) Extend the arms of the test dummy as far as possible in the upward vertical direction. Extend the legs of the dummy as far as possible in the forward horizontal direction, with the dummy feet perpendicular to the centerline of the lower legs.

(c) Using a flat square surface with an area of 4 square inches, apply a force of 40 pounds, perpendicular to the plane of the back of the standard seat assembly, first against the dummy crotch and then at the dummy thorax in the midsagittal plane of the dummy. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions provided in accordance with S5.6.

(d) After the steps specified in paragraph (c) of this section, rotate each dummy limb downwards in the plane parallel to its midsagittal plane until the limb contacts a surface of the child restraints system or the standard seat. Position the limbs, if necessary, so that limb placement does not inhibit torso or head movement in tests conducted under S6.

S6.1.2.3.2 When placing the 6-month-old dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning provided with the system by the manufacturer in accordance with S5.6 while conforming to the following:

(a) With the dummy in the supine position on a horizontal surface, and while preventing movement of the dummy torso by placing a hand on the center of the torso, rotate the dummy legs upward by lifting the feet until the legs contact the upper torso and the feet touch the head, and then slowly release

the legs but do not return them to the flat surface.

(b) Place the dummy in the child restraint system so that the back of the dummy torso contacts the back support surface of the system. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions provided in accordance with S5.6. If the dummy's head does not remain in the proper position, it shall be taped against the front of the seat back surface of the system by means of a single thickness of 1/4-inch-wide paper masking tape placed across the center of the dummy face.

(c) Position the dummy arms vertically upwards and then rotate each arm downward toward the dummy's lower body until it contacts a surface of the child restraint system or the standard seat assembly, ensuring that no arm is restrained from movement in other than the downward direction, by any part of the system or the belts used to anchor the system to the standard seat assembly.

S6.1.2.3.3 When placing the 6-month-old dummy or 3-year-old dummy in a car bed, place the dummy in the car bed in the supine position with its midsagittal plane perpendicular to the center SORL of the standard seat assembly and position the dummy within the car bed in accordance with instructions for child positioning provided with the car bed by its manufacturer in accordance with S5.6.

S6.1.2.4 If provided, shoulder and pelvic belts that directly restrain the dummy shall be adjusted as follows:

Tighten the belts until a 2-pound force applied (as illustrated in figure 5) to the webbing at the top of each dummy shoulder and to the pelvic webbing two inches on either side of the torso midsagittal plane pulls the webbing 1/4 inch from the dummy.

S6.1.2.5 Accelerate the test platform to simulate frontal impact in accordance with S6.1.1.2(a) or S6.1.1.2(b), as appropriate.

S6.1.2.6 Measure dummy excursion and determine conformance to the

requirements specified in S5.1 as appropriate.

S6.2 *Buckle release test procedure.* The buckles on the belts of each child restraint system equipped with buckled belts shall be tested in accordance with S6.2.1 through S6.2.5.

S6.2.1 Install the child restraint system on a standard seat assembly and place the appropriate test dummy in the system in accordance with S6.1.2.1 through S6.1.2.4.

S6.2.2 Tie a self-adjusting sling to each ankle and wrist of the dummy in the manner illustrated in figure 4.

S6.2.3 Pull the sling horizontally in the manner illustrated in figure 4 and parallel to the center SORL of the seat assembly and apply a force of 20 pounds in the case of a system tested with a 6 month-old dummy and 45 pounds in the case of a system tested with a 3 year-old dummy.

S6.2.4 While applying the force specified in S6.2.3, operate the buckle release mechanism in the manner specified in S5.2(d) of Standard No. 209 (S571.209).

S6.2.5 Measure the force required to release the buckle.

S6.3 *Head impact protection—energy absorbing material test procedure.*

S6.3.1 Prepare and test specimens of the energy absorbing material used to comply with S5.2.3 in accordance with the applicable 25 percent compression-deflection test described in the American Society for Testing and Materials (ASTM) Standard D1056-73, "Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber," or D1564-71 "Standard Method of Testing Flexible Cellular Materials—Slab Urethane Foam" or D1565-76 "Standard Specification for Flexible Cellular Materials—Vinyl Chloride Polymer and Copolymer open-cell foams."

S7 *Test dummies.*

S7.1 *Six-month-old dummy.* An unclothed "Six-month-old Size Manikin" conforming to Subpart D of Part 572 of this chapter is used for testing a child restraint system that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing not more than 20 pounds.

S7.2 *Three-year-old dummy.* A three-year-old dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

S7.2.1 Before being used in testing under this standard, the dummy is

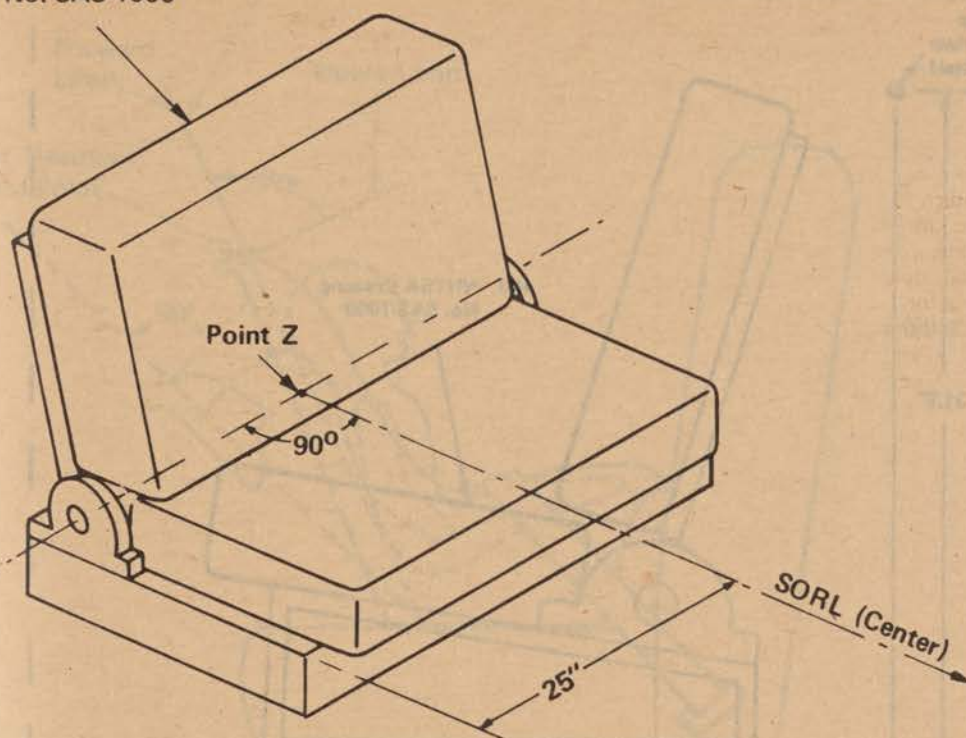
conditioned at any ambient temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent for at least 4 hours.

S7.2.2 When used in testing under this standard, the dummy is clothed in thermal knit waffle-weave polyester and cotton underwear, a size 4 long-sleeved shirt weighing 0.2 pounds, a size 4 pair of long pants weighing 0.2 pounds and cut off just far enough above the knee to allow the knee target to be visible, and size 7M sneakers with rubber toe caps, uppers of dacron and cotton or nylon and a total weight of 1 pound. Clothing other than the shoes is machine-washed in 160° F to 180° F water and machine-dried at 120° F to 140° F for 30 minutes.

S7.3 *Standard seat assembly.* The standard seat assembly used in testing under this standard is a simulated vehicle bench seat, with three seating positions, which is described in Drawing Package SAD-100-1000 and consists of drawings and a bill of materials.

BILLING CODE 4910-59-M

Ref. NHTSA Drawing
No. SAS-1000



SORL=SEAT ORIENTATION REFERENCE LINE (HORIZONTAL)

SORL LOCATION ON THE STANDARD SEAT

FIGURE 1A

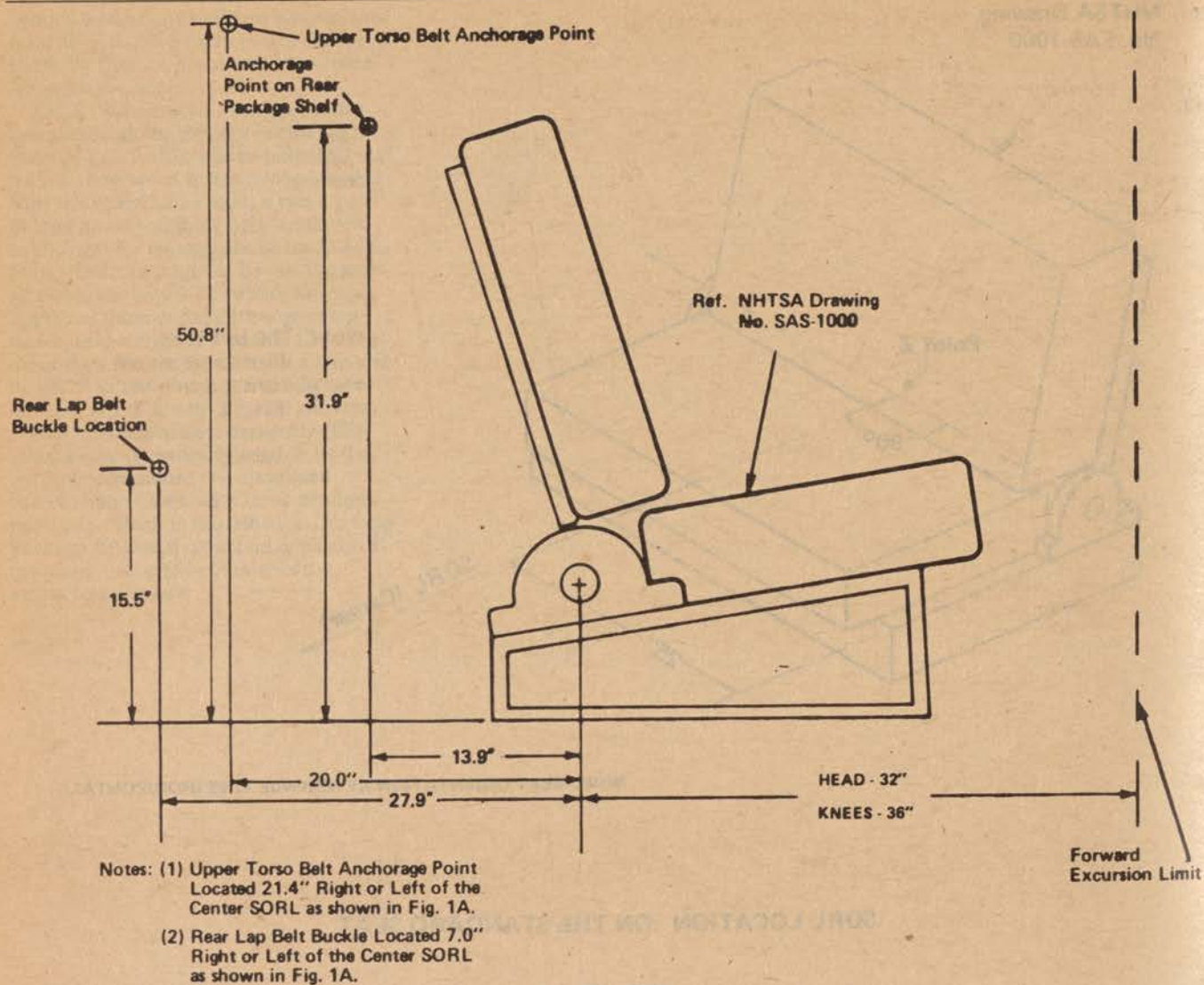
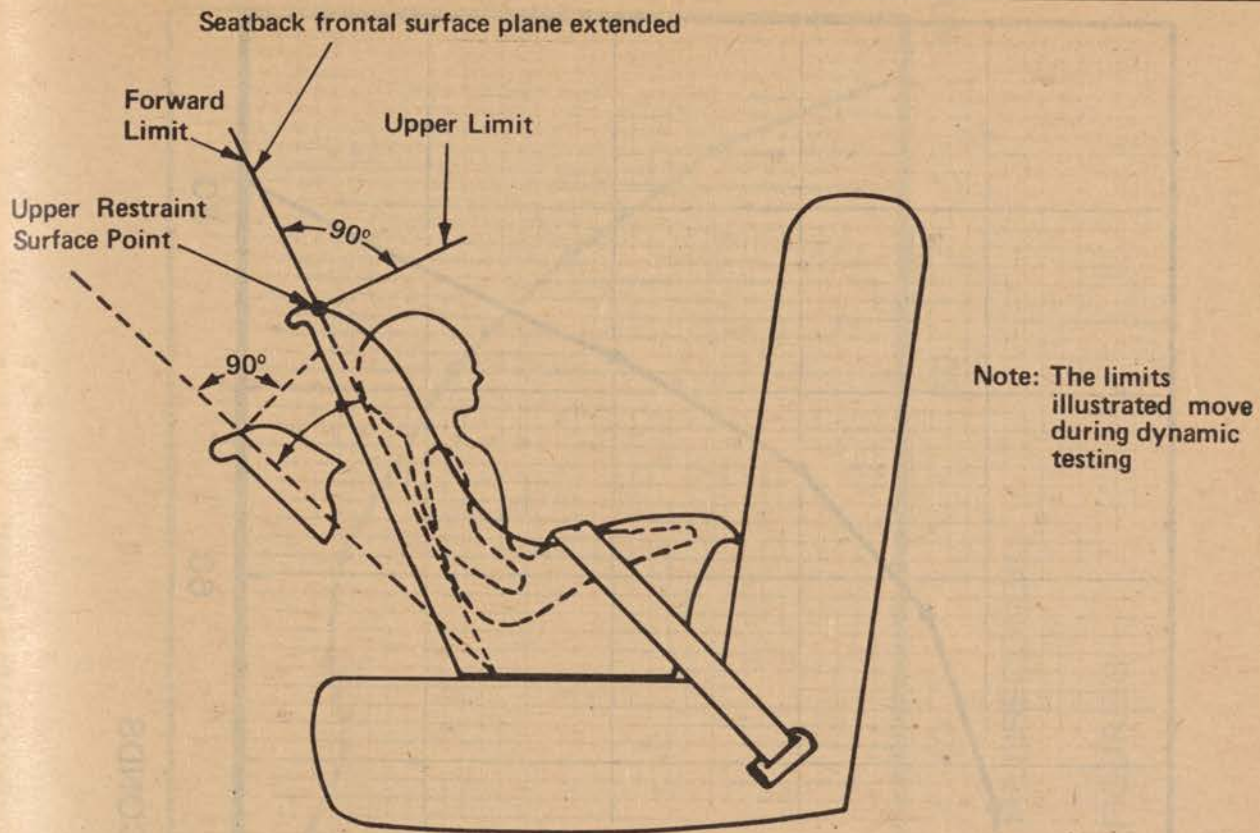


FIGURE 1B



REAR FACING CHILD RESTRAINT
FORWARD AND UPPER HEAD EXCURSION LIMITS

FIGURE 1C

ACCELERATION FUNCTION FOR $\Delta V = 30$ MPH.

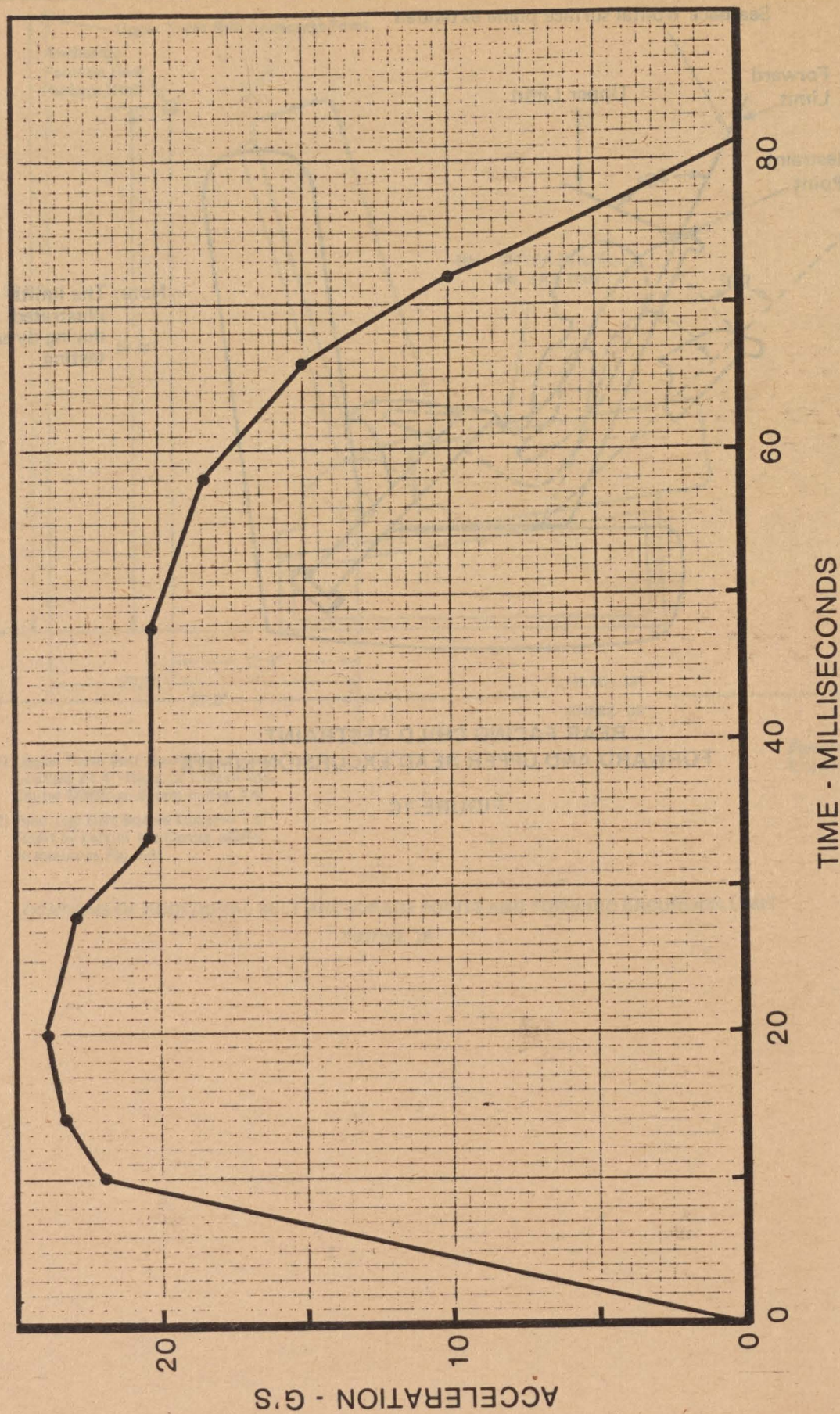


FIGURE 2

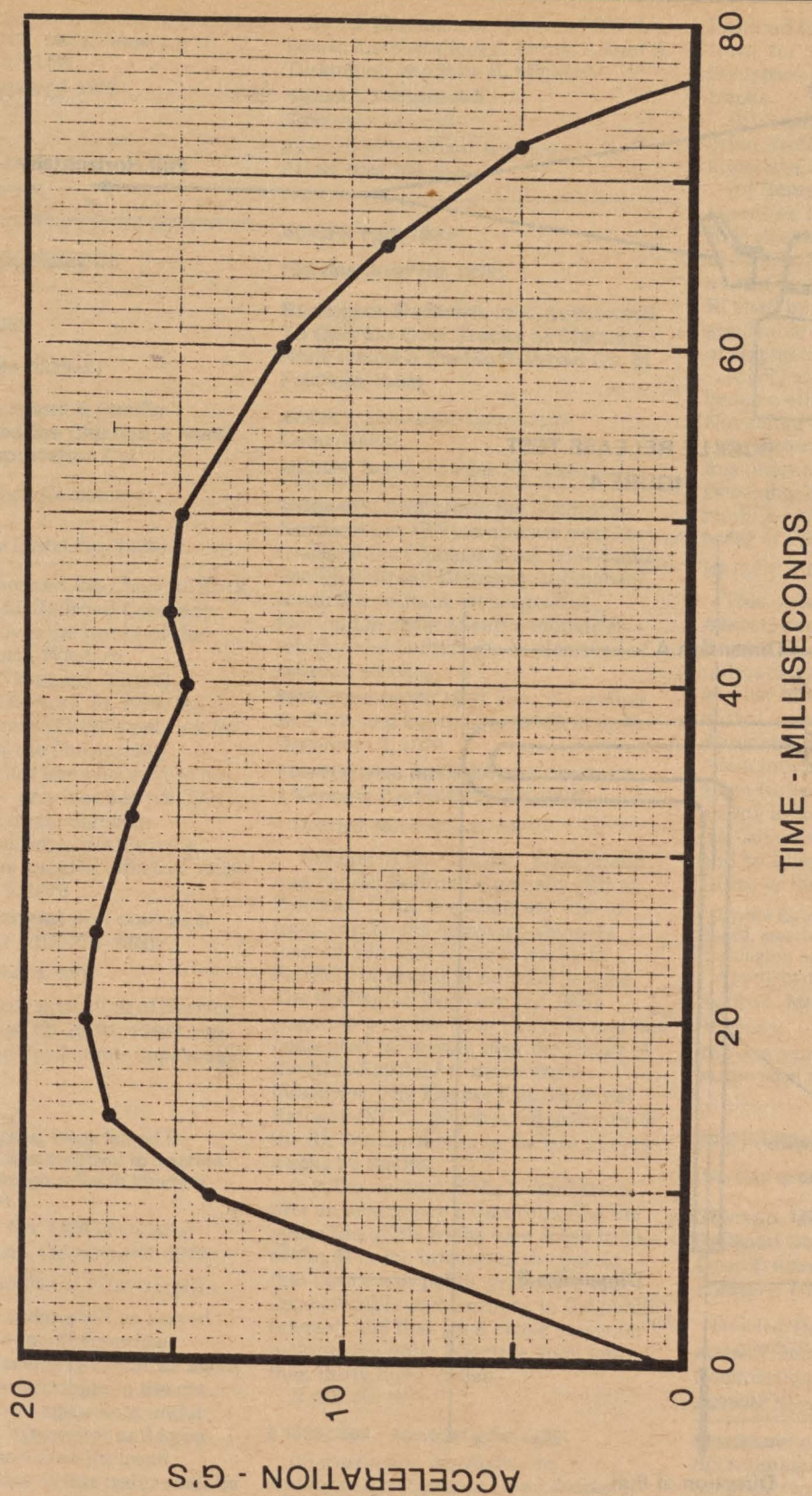
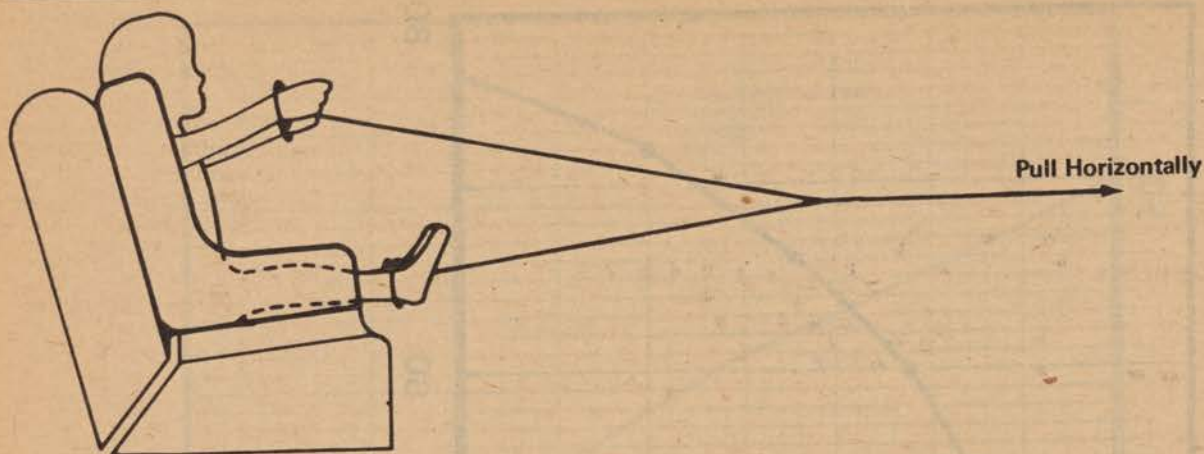
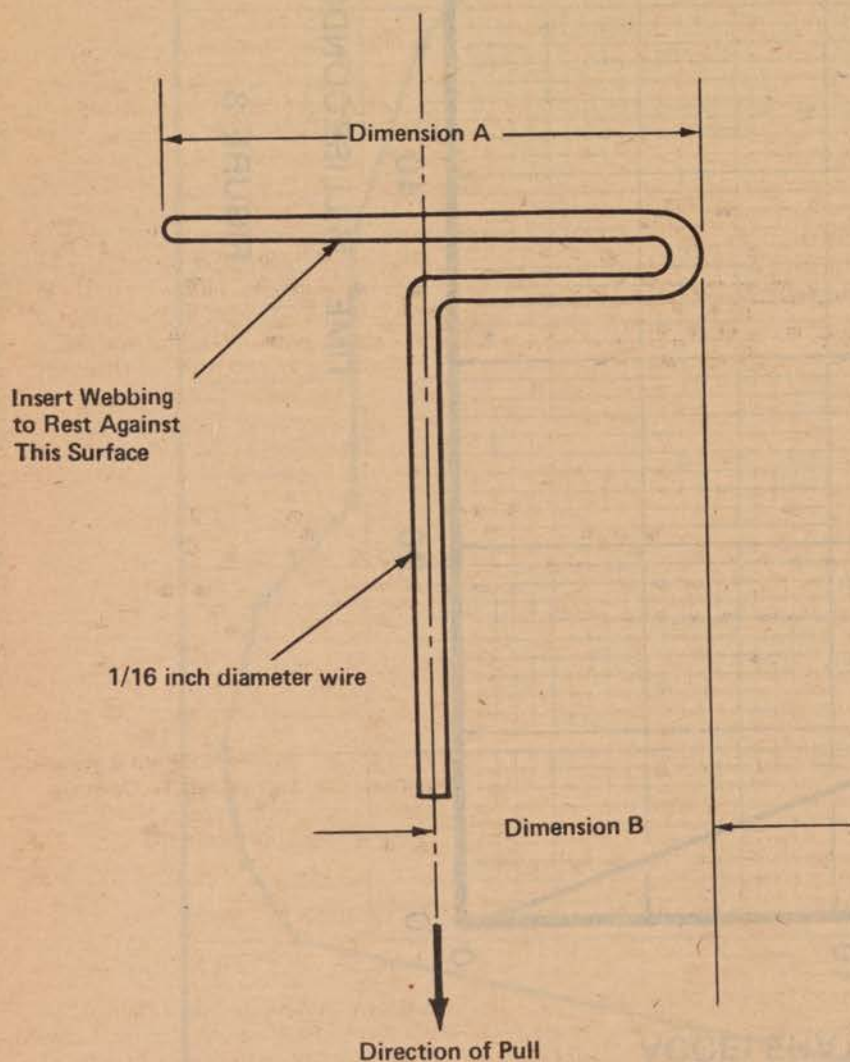
ACCELERATION FUNCTION FOR $\Delta V = 20$ MPH.

FIGURE 3



BUCKLE RELEASE TEST
FIGURE 4



Dimension A - Width of Webbing Plus 1/8 inch

Dimension B - 1/2 of Dimension A

WEBBING TENSION PULL DEVICE

FIGURE 5

(Secs. 103, 112, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50)

Issued on December 5, 1979.

Joan Claybrook,
Administrator.

[FR Doc. 79-37868 Filed 12-10-79; 8:45 am]

BILLING CODE 4910-59-M

INTERSTATE COMMERCE COMMISSION

49 CFR Part 1033

[Service Order No. 1329-A]

Chicago, Rock Island & Pacific Railroad Co. and the Chicago & North Western Transportation Co.

AGENCY: Interstate Commerce Commission.

ACTION: Service Order No. 1329-A.

SUMMARY: Authorized the Chicago, Rock Island and Pacific Railroad Company (RI) to operate over the tracks of the Chicago and North Western Transportation Company (CNW) at Livermore, IA. On April 18, 1979, the Commission granted CNW's petition for abandonment of the line serving Livermore and that line was sold to the industry. RI now provides service over industry owned track. Since an emergency no longer exists, Service Order No. 1329 is vacated effective 11:59 p.m., December 5, 1979.

FOR FURTHER INFORMATION CONTACT: J. Kenneth Carter (202) 275-7840.

Decided December 5, 1979.

Upon further consideration of Service Order No. 1329 (43 FR 26581; 45868 and 44 FR 19203), and good cause appearing therefor:

It is ordered:

§ 1033.1329 **Chicago, Rock Island & Pacific Railroad Co. authorized to operate over tracks of Chicago & North Western Transportation Co.**

Service Order No. 1329 is vacated effective 11:59 p.m., December 5, 1979.

(49 U.S.C. (10304-10305 and 11121-11126))

A copy of this order shall be served upon the Association of American Railroads, Car Service Division, as agent of the railroads subscribing to the car service and car hire agreement under the terms of that agreement and upon the American Short Line Railroad Association. Notice of this order shall be given to the general public by depositing a copy in the Office of the Secretary of the Commission, at Washington, D.C., and by filing a copy with the Director, Office of the Federal Register.

By the Commission, Railroad Service Board, members Joel E. Burns, Robert S. Turkington and John R. Michael.

Agatha L. Mergenovich
Secretary.

[FR Doc. 79-38173 Filed 12-12-79; 8:45 am]

BILLING CODE 7035-01-M

49 CFR Part 1033

[Service Order No. 1409]

Burlington Northern, Inc., Authorized To Operate Over Tracks of Chicago, Rock Island & Pacific Railroad Co. at Fairfield, Iowa

AGENCY: Interstate Commerce Commission.

ACTION: Service Order No. 1409.

SUMMARY: Authorizes the Burlington Northern Inc. (BN) to operate over the tracks of the Chicago, Rock Island and Pacific Railroad Company at Fairfield, Iowa, due to track embargoes at Fairfield in order to serve industries which would otherwise be deprived of railroad service.

EFFECTIVE DATE: 12:01 a.m., November 28, 1979, and continuing in effect until December 3, 1979.

FOR FURTHER INFORMATION CONTACT: J. Kenneth Carter (202) 275-7840.

Decided: November 27, 1979.

The line of the Chicago, Rock Island and Pacific Railroad Company (RI) at Fairfield, Iowa, is embargoed due to track conditions depriving shippers located adjacent to these tracks in Fairfield of essential railroad service. The Burlington Northern Inc. (BN) connects with the RI at Fairfield and has consented to operate over the tracks of the RI in Fairfield to serve these industries. The Kansas City Terminal Railway (KCT), the directed operator of the RI, has consented to the use of these tracks by the BN.

It is the opinion of the Commission that an emergency exists requiring the operation of BN trains over these tracks of the RI in the interest of the public; that notice and public procedure are impracticable and contrary to the public interest; and that good cause exists for making this order effective upon less than thirty days' notice.

It is ordered.

§ 1033.1409 **Service Order 1409.**

(a) **Burlington Northern Inc. Authorized to Operate Over Tracks of Chicago, Rock Island and Pacific Railroad Company at Fairfield, Iowa.** The Burlington Northern Inc. (BN) is authorized to operate over tracks of the Chicago, Rock Island and Pacific

Railroad Company (RI) at Fairfield, Iowa, for the purpose of serving industries located adjacent to such tracks.

(b) **Application.** The provisions of this order shall apply to intrastate, interstate, and foreign traffic.

(c) **Rates applicable.** Inasmuch as this operation by the BN over tracks of the RI is deemed to be due to carrier's disability, the rates applicable to traffic moved by the BN over the tracks of the RI shall be the rates which were applicable on the shipments at the time of shipment as originally routed.

(d) **Effective date.** This order shall become effective at 12:01 a.m., November 28, 1979.

(e) **Expiration date.** The provisions of this order shall expire at 11:59 p.m., December 3, 1979, unless otherwise modified, changed or suspended by order of this Commission.

(49 U.S.C. (10304-10305 and 11121-11126))

This order shall be served upon the Association of American Railroads, Car Service Division, as agent of the railroads subscribing to the car service and car hire agreement under the terms of that agreement and upon the American Short Line Railroad Association. Notice of this order shall be given to the general public by depositing a copy in the Office of the Secretary of the Commission at Washington, D.C., and by filing a copy with the Director, Office of the Federal Register.

By the Commission, Railroad Service Board, members Joel E. Burns, Robert S. Turkington and John R. Michael. Joel E. Burns not participating.

Agatha L. Mergenovich,
Secretary.

[FR Doc. 79-37813 Filed 12-12-79; 8:45 am]

BILLING CODE 7035-01-M

49 CFR Part 1033

[Service Order No. 1341-A]

Chicago, Milwaukee, St. Paul & Pacific Railroad Co. Authorized To Operate Over Tracks of Chicago & North Western Transportation Co.

Decided: December 5, 1979.

AGENCY: Interstate Commerce Commission.

ACTION: Service Order No. 1341-A.

SUMMARY: Authorized the Chicago, Milwaukee, St. Paul and Pacific Railroad Company to operate over the tracks of the Chicago and North Western Transportation Company at Winnebago, Minnesota. The Commission's order served September 17, 1979, permitted the abandonment by the Chicago and North